MINERALS YEARBOOK

AREA REPORTS: DOMESTIC 1995

Volume II



U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

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UNITED STATES DEPARTMENT OF THE INTERIOR • Bruce Babbitt, Secretary

GEOLOGICAL SURVEY

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people by encouraging care. The Department also has a major responsibility for Native American reservation communities and for people who live in Island Territories under U.S. administration.

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Preface

This edition of the Minerals Yearbook discusses the performance of the worldwide minerals and materials industry during 1995 and provides background information to assist in interpreting that performance. Content of the individual Minerals Yearbook volumes follows:

Volume I, Metals and Minerals, contains chapters about virtually all metallic and industrial mineral commodities important to the U.S. economy. A chapter on survey methods with a statistical summary of nonfuel minerals and a chapter on trends in mining and quarrying in the metals and industrial minerals industries in the United States are also included.

Volume II, Area Reports: Domestic, contains a chapter on the minerals industry of each of the 50 States and Puerto Rico and the Administered Islands. This volume also has a chapter on survey methods used in data collection, including a statistical summary of domestic nonfuel minerals.

Volume III, Area Reports: International, is published for separate reports. These reports collectively contain the latest available mineral data on more than 190 foreign countries and discuss the importance of minerals to the economies of these nations and the United States. Each report begins with an overview of the region's mineral industries during the year. It continues with individual country chapters that examine, the mining, refining, processing, and utilization of minerals in each country of the region and how they relate to U.S. industry. Most chapters include production tables, industry structure tables, information, about Government policies and programs affecting the country's minerals industry, and an outlook section.

The U.S. Geological Survey continually strives to improve the value of its publications to users. Constructive comments and suggestions by readers of the Minerals Yearbook are welcomed.

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Acknowledgments

This volume was written by Arnold Tanner, with assistance from Roger Loebenstein, both physical scientists with the Minerals Information Team (MIT) of the U.S. Geological Survey (USGS). All rankings and statistical analyses were performed by Mr. Tanner and were based on data reported to the USGS by companies responding to the annual canvass of nonfuel mineral production in the United States. Data and related rankings for 1995 were preliminary owing to publication of this volume before final data for all commodities were available; data and related rankings prior to 1995 were from final tabulations. The narrative portions of each chapter reporting information on mining, mineral exploration, and other mining-related activities or legislation, tailored for each State, were derived from information submitted by officials from each participating State. These significantly broadened the scope of the subject chapters. The State "principal mineral-producing location" maps were revised in November 1995 in collaboration with the State Geologists and/or minerals information agency Directors. All chapters underwent technical review by USGS mineral commodity specialists and other agency professionals. The melding of their knowledge and expertise into this project was invaluable in producing accurate individual documents and was greatly appreciated. Previously, all State chapters were published individually under the title "Mineral Industry Surveys," except for the tables of detailed crushed stone data (1994) by State and State districts. These data were included in this Minerals Yearbook volume as they traditionally have been.

The Survey Methods chapter, the Statistical Summary of Nonfuel Minerals chapter, and the tabular material covering total State nonfuel mineral production (and mineral production by county) also were prepared by the MIT. Compilations of data contained in this volume were based largely on statistics and other data provided by the mineral industries. The USGS gratefully acknowledges the willing contribution of these essential data by both companies and individuals.

In the collection of statistical and other mineral industry information, the USGS also was assisted by various State agencies through cooperative Memorandum of Understanding (MOU) agreements. Some of the chapters in Volume II were reviewed by staff members of these agencies. The State agencies contributing mining and minerals industry information included in the chapter narratives are recognized below by an asterisk (*). Our sincere appreciation for all agency cooperation is extended to the State Government agencies that had MOU's with the U.S. Bureau of Mines (USBM). The USBM minerals information activities, including State minerals information MOU's were transferred to the USGS in January 1996. State agencies holding MOU's with the USGS are as follows:

Alabama: Geological Survey of Alabama*
Arizona: Arizona Department of Mines and Mineral Resources*
Arkansas: Arkansas Geological Commission*
California: California Department of Conservation, Division of Mines and Geology*
Colorado: Colorado Geological Survey*
Connecticut: Connecticut Geological and Natural History Survey, Department of Environmental Protection*
Delaware: Delaware Geological Survey*
Florida: Florida Geological Survey*
Georgia: Georgia Geologic Survey, Environmental Protection Division, Georgia Department of Natural Resources*
Hawaii: Department of Land and Natural Resources of the State of Hawaii
Idaho: Idaho Geological Survey*
Illinois: State Geological Survey, Illinois Department of Energy and Natural Resources*
Indiana: Indiana Geological Survey*
Iowa: Geological Survey Bureau, Iowa Department of Natural Resources*

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Kansas: Kansas Geological Survey*
Kentucky: Kentucky Geological Survey*
Louisiana: Louisiana Geological Survey*
Maine: Maine Geological Survey*
Maryland: Maryland Geological Survey, Department of Natural Resources.
Massachusetts: Commonwealth of Massachusetts, Executive Office of Environmental Affairs.
Michigan: Geological Survey Division, Michigan Department of Natural Resources*
Mississippi: Office of Geology, Mississippi Department of Environmental Quality*
Missouri: Missouri Department of Natural Resources, Division of Geology and Land Survey*
Montana: Montana Bureau of Mines and Geology*
Nebraska: Nebraska Geological Survey, Conservation and Survey Division, University of Nebraska-Lincoln*
Nevada: Nevada Geological Survey, Nevada Bureau of Mines and Geology*
New Hampshire: New Hampshire Department of Environmental Services.
New Jersey: New Jersey Geological Survey, New Jersey Department of Environmental Protection and Energy, Division of Science and Research*
New Mexico: New Mexico Bureau of Mines and Mineral Resources*
New York: New York Geological Survey, New York State Education Department*
North Carolina: Division of Land Resources, Geological Survey Section, North Carolina Department of Environment, Health, and Natural Resources.
North Dakota: North Dakota Geological Survey*
Ohio: Ohio Department of Natural Resources, Division of Geological Survey*
Oklahoma: Oklahoma Geological Survey*
Pennsylvania: Pennsylvania Geological Survey, Department of Environmental Resources*
Puerto Rico: Department of Natural Resources, Commonwealth of Puerto Rico.
Rhode Island: Office of the Rhode Island State Geologist, Department of Environmental Management.
South Carolina: South Carolina Geological Survey.
South Dakota: South Dakota Geological Survey*
Tennessee: Tennessee Division of Geology*
Texas: Bureau of Economic Geology, The University of Texas at Austin*
Utah: Utah Geological Survey*
Vermont: Office of the State Geologist, Vermont Geological Survey, Agency of Natural Resources*
Virginia: Virginia Department of Mines, Minerals and Energy, Division of Mineral Resources*
Washington: Washington State Department of Natural Resources, Geology and Earth Resources Division*
West Virginia: West Virginia Geological and Economic Survey*
Wisconsin: Wisconsin Geological and Natural History Survey*
Wyoming: Wyoming State Geological Survey*

While not executing MOU agreements with the USGS, Alaska's Division of Geological and Geophysical Surveys (Alaska Department of Natural Resources), the Maryland Department of the Environment (Minerals, Oil and Gas Division), and the Minnesota Geological Survey contributed mining and minerals information concerning the processing industry in their States. Our sincere appreciation also is extended to them for their cooperation and assistance.

John H. DeYoung, Jr.
Acting Chief Scientist, Minerals Information Team

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STATISTICAL SUMMARY OF NONFUEL MINERALS

By Stephen D. Smith

Mr. Smith, industry data analyst in the Section of Industry Data Analysis and Coordination, was assisted in the preparation of the Statistical Summary by Imogene P. Bynum, Chief, Section of Metals Data; Christopher Lindsay, Co-chiefs, Sections of Industrial Minerals Data; and Raymond L. Cantrell, Physical scientist, Branch of Industrial Minerals.

This preliminary annual report summarizes data on crude nonfuel mineral production for the United States, its island possessions, and the Commonwealth of Puerto Rico.

Although crude mineral production may be measured at any of several stages of extraction and processing, the stage of measurement used in this preliminary annual report is what is termed "mine output." This term refers to minerals or ores in the form in which they are first extracted from the ground, but customarily may include the output from auxiliary processing at or near the mines.

Because of inadequacies in the statistics available, some series deviate from the foregoing definition. For copper, gold, lead, silver, tin, and zinc, the quantities shown are recorded on a mine basis (as the recoverable content of ore sold or treated). However, the preliminary values assigned to the quantities are based on the average selling price of refined metal, not the mine value. Mercury is measured as recovered metal and valued at the average New York price for the metal. Values shown are in current dollars, with no adjustments made to compensate for changes in the purchasing power of the dollar.

The preliminary total value of all nonfuel mineral production in the United States increased about 7% to an estimated $37.6 billion in 1995, with metals increasing almost 13% to $13.7 billion and industrial minerals rising approximately 4% to $23.9 billion over that of 1994. Nine of the estimated mineral commodities produced in the United States in 1995 had an individual total production value greater than $1 billion. These commodities, in decending order, stone (crushed and broken); copper;— cement (portland); gold; sand and gravel (construction); clays; iron ore; lime; and salt;— comprised over 80% of the U.S. total production. (*See table 1.*)

In 1995 twelve States produced mineral commodities with individual estimated total production values of greater than $1 billion. These States, in decending order,— Arizona; Nevada; California; Utah; Georgia; Texas; Minnesota; Michigan; Florida; Missouri; New Mexico; and Pennsylvania; comprised almost 60% of the estimated U.S. total production. (*See table 4.*)

TABLE 1
NONFUEL MINERAL PRODUCTION[1] IN THE UNITED STATES[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
METALS							
Beryllium concentrates	metric tons	4,940	$5	4,330	$5	5,630	$6
Copper[3]	do.	1,800,000	3,640,000	1,810,000	4,430,000	1,890,000	5,710,000
Gold[3]	kilograms	331,000	3,840,000	[4]326,000	[r 4]4,040,000	[4]320,000	[4]3,840,000
Iron ore	thousand metric tons	56,300	1,640,000	57,600	1,580,000	62,000	1,700,000
Iron oxide pigments (crude)	metric tons	35,800	$5,020	46,400	$6,010	46,400	$6,010
Lead[3]	do.	355,000	249,000	363,000	298,000	374,000	346,000
Magnesium metal	do.	132,000	377,000	128,000	389,000	140,000	461,000
Molybdenum[3]	do.	39,200	165,000	46,000	284,000	W	W

See footnotes at end of table.

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TABLE 1—Continued

NONFUEL MINERAL PRODUCTION[1] IN THE UNITED STATES[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
METALS—Continued							
Nickel ore[6]	do.	2,460	W	—	—	1,650	W
Palladium	kilograms	6,500	25,300	6,440	29,400	6,400	29,200
Platinum	do.	1,800	21,400	1,960	25,300	2,000	25,800
Silver[3]	metric tons	1,650	227,000	1,480	252,000	1,500	256,000
Zinc[3]	do.	488,000	497,000	570,000	619,000	600,000	701,000
Combined value of antimony, bauxite, manganiferous ore (Mn), mercury, rare-earth metal concentrates, tin (1993), titanium concentrates (ilmenite and rutile), tungsten, vanadium, zircon concentrates, and values indicated by symbol W		XX	132,000	XX	147,000	XX	625,000
Total metals		XX	10,800,000	XX	r12,100,000	XX	13,700,000
INDUSTRIAL MINERALS (EXCLUDING FUELS)							
Asbestos	metric tons	13,400	5,960	10,100	5,120	9,660	5,130
Barite	do.	315,000	19,300	583,000	21,700	525,000	21,400
Boron minerals (B_2O_3)	do.	574,000	373,000	550,000	443,000	546,000	462,000
Bromine[e]	do.	177,000	123,000	W	W	211,000	186,000
Cement:							
Masonry	do.	2,960,000	229,000	3,610,000	286,000	3,510,000	278,000
Portland	do.	71,600,000	3,920,000	74,300,000	4,460,000	72,100,000	4,330,000
Clays	thousand metric tons	40,700	1,470,000	42,200	1,600,000	46,600	1,780,000
Diatomite	metric tons	599,000	150,000	613,000	r152,000	672,000	174,000
Feldspar	do.	770,000	31,400	765,000	31,200	770,000	32,400
Garnet (abrasive)	do.	W	W	r51,000	r15,400	W	W
Gemstones		NA	57,700	NA	50,500	NA	75,500
Gypsum (crude)	thousand metric tons	15,800	107,000	17,200	115,000	17,200	117,000
Helium:							
Crude	million cubic meters	29	25,800	39	38,500	40	40,000
Grade-A	do.	96	189,000	100	199,000	102	205,000
Iodine	metric tons	1,940	15,400	1,630	12,800	1,830	19,600
Lime	thousand metric tons	16,800	965,000	17,400	1,020,000	18,400	1,060,000
Mica (scrap)	do.	88	4,450	110	7,280	104	7,470
Peat	metric tons	612,000	16,800	552,000	15,300	r577,000	r15,600
Perlite	do.	569,000	17,400	644,000	19,400	719,000	21,100
Phosphate rock	thousand metric tons	35,500	759,000	41,100	839,000	45,500	934,000
Potash (K_2O)	do.	1,470	284,000	r1,470	r284,000	1,470	295,000
Pumice and pumicite	metric tons	469,000	12,000	490,000	11,800	544,000	12,600
Salt	thousand metric tons	38,700	893,000	40,500	996,000	43,400	1,020,000
Sand and gravel:							
Construction	do.	869,000	3,530,000	891,000	3,740,000	879,000	3,770,000
Industrial	metric tons	26,200,000	454,000	27,300,000	488,000	28,200,000	479,000
Silica stone[8]	do.	528	330	r510	r3,940	309	1,490
Sodium compounds:							
Soda ash	thousand metric tons	8,960	734,000	9,320	724,000	9,800	750,000
Sodium sulfate (natural)	metric tons	W	W	298	11,400	325	33,000
Stone:[9]							
Crushed	thousand metric tons	1,130,000	$6,030,000	1,230,000	$6,620,000	1,280,000	$7,030,000

See footnotes at end of table.

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TABLE 1—Continued

NONFUEL MINERAL PRODUCTION[1] IN THE UNITED STATES[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
INDUSTRIAL MINERALS (EXCLUDING FUELS)—Continued							
Stone—Continued[9]:							
Dimension	metric tons	1,230,000	216,000	W	W	W	W
Sulfur (Frasch)	thousand metric tons	1,900	101,000	3,010	162,000	W	W
Talc and pyrophillite	metric tons	W	W	W	W	1,110,000	35,000
Tripoli	do.	94,000	4,090	[e]82,400	[r]10,900	W	W
Vermiculite	do.	187,000	14,900	177,000	14,200	170,000	W
Zeolites	do.	41,000	NA	58,000	NA	NA	NA
Combined value of brucite, emery, fluorspar, greensand marl, kyanite, lithium minerals, magnesite, magnesium compounds, olivine, pyrites[10] (1993), sand and gravel (construction), (1993)], staurolite, wollastonite, and values indicated by symbol W		XX	417,000	XX	[r]692,000	XX	714,000
Total industrial minerals		XX	21,200,000	XX	[r]23,100,000	XX	23,900,000
Grand total		XX	32,000,000	XX	[r]35,200,000	XX	37,600,000

[e]Estimated. [r]Revised. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Placer canvassing discontinued beginning 1994. May include some placer data from other sources.

[5]Content of ore and concentrate.

[6]Production of ferronickel on a contained Ni basis has been as follows: 1993--4,878 metric tons valued at $28.0 million; 1994--the Nickel Mountain Mine was idle; and in 1995--an estimated 8,200 metric tons valued at $68.0 million.

[7]Data series changed to production beginning in 1995, prior years shipment data may not be comparable.

[8]Formerly identified as "abrasives." Includes grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

[9]Excludes abrasive stone and bituminous limestone and sandstone; all included elsewhere in table.

[10]Pyrite canvassing discontinued beginning in 1994.

TABLE 2

NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 1995[p]

(Based on quantity unless otherwise noted)

Mineral	Principal States	Other States
Antimony[1]	ID	
Asbestos	CA	
Barite	NV, GA, MO, TN, IL, MT	
Bauxite	AL and GA	
Beryllium concentrate	UT	
Boron (B_2O_3)	CA	
Bromine[e]	AR	
Brucite	NV	
Cement:		
Masonry	FL, IN, MD, AL, MI, PA	All other States except AK, CT, DE, LA, MA, MN, MS, NV, NH, NJ, NC, ND, OR, RI, VT, WI, WY.
Portland	CA, TX, PA, MI, AL, MO	All other States except AK, CT, DE, LA, MA, MN, NH, NJ, NC, ND, RI, VT, WI.
Clays	GA, AL, CA, TX, WY, OH	All other States except AK, DE, HI, RI, VT, WI.
Copper[1]	AZ, UT, NM, MT, WI, MI	ID, IL, MO, NV, OR, TN.

See footnotes at end of table.

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TABLE 2—Continued

NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 1995[p]

(Based on quantity unless otherwise noted)

Mineral	Principal States	Other States
Diatomite	CA, NV, OR, WA	
Emery	OR	
Feldspar	NC, VA, OK, GA, CA, ID	SD.
Fluorspar	IL	
Garnet (abrasive)	ID and NY	
Gemstones (natural)[2]	TN, AL, AR, NC, OR, AZ	All other States.
Gold[1 3]	NV, CA, UT, SD, MT, WA	AK, AZ, CO, ID, NM, OR, SC, WI.
Greensand marl	NJ	
Gypsum (crude)	OK, IA, TX, MI, NV, CA	AR, AZ, CO, IN, KS, LA, NM, NY, OH, UT, VA, WY.
Helium (crude and Grade-A)	KS, WY, TX, CO, UT	
Iodine	OK	
Iron ore (usable)[4]	MN, MI, MO, UT, DS, TX	NM and CA.
Iron oxide pigments (crude)	MI, MO, GA, VA, AZ	
Kyanite	VA	
Lead[1]	MO, AK, ID, MT, CO, NY	
Lime	OH, MO, AL, PA, KY, TX	All other States except AK, CT, DE, FL, GA, HI, KS, ME, MD, MS, NH, NJ, NM, NY, NC, RI, SC, VT.
Lithium minerals	NC and NV	
Magnesite	NV	
Magnesium compounds	MI, CA, FL, UT, DE, TX	
Magnesium metal	TX, WA, UT	
Manganiferous ore	SC	
Mercury	NV, UT, CA	
Mica (scrap)	NC, NM, GA, SC, SD	
Molybdenum	AZ, CO, UT, ID, MT, NM	
Nickel ore	OR	
Olivine	NC and WA	
Palladium metal	MT	
Peat	MI, FL, ME, IL, MN, NC	CO, IN, IA, MA, MT, NJ, NY, ND, OH, PA, SC, WA, WV, WI.
Perlite	NM, AZ, CA, NV	
Phosphate rock	FL, ID, NC, UT	
Platinum metal	MT	
Potash	NM, UT, CA, MI	
Pumice	OR, NM, ID, CA, AZ, KS	
Rare-earth metal concentrates	CA	
Salt	LA, TX, NY, OH, KS, UT	AL, AZ, CA, MI, NV, NM, OK, WV.
Sand and gravel:		
Construction	CA, TX, MI, OH, WA, AZ	All other States.
Industrial	IL, MI, NJ, CA, WI, TX	All other States except AK, CT, DE, HI, KY, ME, NH, NM, OR, SD, UT, VT, WY.
Silica stone[5]	AR and WI	
Silver[1]	NV, AZ, ID, UT, AK, MT	CA, CO, IL, MI, MO, NM, NY, OR, SC, SD, TN, WA, WI.
Sodium compounds:		
Soda ash	WY and CA	
Sodium sulfate (natural)	TX, CA	
Staurolite	FL	
Stone:		
Crushed	TX, PA, MO, FL, GA, IL	All other States except DE and ND.
Dimension	GA, IN, WI, VT, MA, PA	All other States except AK, DE, FL, HI, IL, KY, LA, MS, NE, NV, NJ, ND, OR, RI, WA, WV, WY.

See footnotes at end of table.

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TABLE 2—Continued

NONFUEL MINERALS PRODUCED IN THE UNITED STATES, BY COMMODITY AND STATES IN 1995[p]

(Based on quantity unless otherwise noted)

Mineral	Principal States	Other States
Sulfur (Frasch)	LA and TX	
Talc and pyrophyllite	MT, TX, VT, NY, NC, CA	VA and OR.
Tin	(e)	
Titanium concentrates	FL and CA	
Tripoli	IL, OK, AR, PA	
Tungsten[1]	CA	
Vanadium[1]	ID	
Vermiculite (crude)	SC and VA	
Wollastonite	NY	
Zinc[1]	AK, TN, NY, MO, MT, CO	IL, ID, OR.
Zircon concentrates	FL	

[e]Estimated. [p] Preliminary.
[1]Content of ores, etc.
[2]Principal producing States based on value.
[3]Placer canvassing discontinued beginning in 1994. May include some placer data from other sources.
[4]Includes byproduct material.
[5]Formerly identified as "abrasives." Includes grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.
[6]No production.

TABLE 3

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1995[p 1]

State	Value[p] (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Alabama	$676,000	18	1.80	Cement (portland), stone (crushed and broken), lime, sand and gravel (construction), clays, cement (masonry).
Alaska	594,000	21	1.58	Zinc, gold, sand and gravel (construction), lead, stone (crushed and broken), silver.
Arizona	4,180,000	1	11.10	Copper, sand and gravel (construction), molybdenum, cement (portland), silver, lime.
Arkansas	[r]451,000	27	1.20	Bromine, stone (crushed and broken), sand and gravel (construction), cement (portland), sand and gravel (industrial), gemstones.
California	2,680,000	3	7.13	Cement (portland), sand and gravel (construction), boron minerals, gold, stone (crushed and broken), diatomite.
Colorado	[r]449,000	28	1.19	Molybdenum, sand and gravel (construction), cement (portland), gold, stone (crushed and broken), zinc.
Connecticut[2]	80,900	44	.22	Stone (crushed and broken), sand and gravel (construction), stone (dimension), clays, gemstones.
Delaware[2]	8,900	50	.02	Sand and gravel (construction), magnesium compounds, gemstones.
Florida	1,390,000	9	3.69	Phosphate rock, stone (crushed and broken), cement (portland), sand and gravel (construction), clays, titanium concentrates.
Georgia	1,670,000	5	4.45	Clays, stone (crushed and broken), cement (portland), stone (dimension), sand and gravel (construction), cement (masonry).
Hawaii[2]	106,000	43	.28	Stone (crushed and broken), cement (portland), sand and gravel (construction), cement (masonry), gemstones.
Idaho	399,000	32	1.06	Phosphate rock, molybdenum, sand and gravel (construction), gold, silver, stone (crushed and broken).
Illinois	820,000	16	2.18	Stone (crushed and broken), cement (portland), sand and gravel (construction), sand and gravel (industrial), lime, clays.
Indiana	574,000	23	1.53	Stone (crushed and broken), cement (portland), sand and gravel (construction), lime, cement (masonry), stone (dimension).
Iowa	484,000	26	1.29	Stone (crushed and broken), cement (portland), sand and gravel (construction), gypsum, lime, cement (masonry).

See footnotes at end of table.

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TABLE 3—Continued

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1995[p 1]

State	Value[p] (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Kansas	$486,000	25	1.29	Helium (Grade-A), salt, cement (portland), stone (crushed and broken), helium (crude), sand and gravel (construction).
Kentucky	401,000	31	1.07	Stone (crushed and broken), lime, cement (portland), sand and gravel (construction), clays, cement (masonry).
Louisiana	387,000	33	1.02	Salt, sulfur (Frasch), sand and gravel (construction), stone (crushed and broken), sand and gravel (industrial), lime.
Maine	58,700	46	.16	Sand and gravel (construction), cement (portland), stone (crushed and broken), stone (dimension), cement (masonry), peat.
Maryland	341,000	35	.91	Stone (crushed and broken), cement (portland), sand and gravel (construction), cement (masonry), stone (dimension), clays.
Massachusetts	213,000	39	.57	Stone (crushed and broken), sand and gravel (construction), lime, stone (dimension), clays, peat.
Michigan	1,470,000	8	3.87	Iron ore, cement (portland), sand and gravel (construction), stone (crushed and broken), magnesium compounds, salt.
Minnesota	1,490,000	7	3.96	Iron ore, sand and gravel (construction), stone (crushed and broken), sand and gravel (industrial), stone (dimension), lime.
Mississippi	125,000	42	.33	Sand and gravel (construction), clays, cement (portland), stone (crushed and broken), sand and gravel (industrial), gemstones.
Missouri	1,110,000	10	2.94	Stone (crushed and broken), lead, cement (portland), lime, zinc, sand and gravel (construction).
Montana	581,000	22	1.55	Gold, copper, cement (portland), molybdenum, sand and gravel (construction), palladium metal.
Nebraska	142,000	41	0.38	Sand and gravel (construction), cement (portland), stone (crushed and broken), clays, lime, cement (masonry).
Nevada	2,920,000	2	7.78	Gold, silver, sand and gravel (construction), diatomite, lime, cement (portland).
New Hampshire[2]	35,600	47	.10	Sand and gravel (construction), stone (crushed and broken), stone (dimension), gemstones, clays.
New Jersey	289,000	37	.77	Stone (crushed and broken), sand and gravel (construction), sand and gravel (industrial), clays, greensand marl, peat.
New Mexico	1,080,000	11	2.87	Copper, potash, sand and gravel (construction), cement (portland), stone (crushed and broken), perlite.
New York	820,000	15	2.18	Stone (crushed and broken), salt, sand and gravel (construction), cement (portland), zinc, wollastonite.
North Carolina	742,000	17	1.97	Stone (crushed and broken), phosphate rock, lithium minerals, sand and gravel (construction), feldspar, sand and gravel (industrial).
North Dakota	24,500	49	.07	Sand and gravel (construction), lime, sand and gravel (industrial), clays, gemstones, peat.
Ohio	880,000	14	2.34	Stone (crushed and broken), sand and gravel (construction), salt, lime, cement (portland), sand and gravel (industrial).
Oklahoma	374,000	34	.99	Stone (crushed and broken), cement (portland), sand and gravel (construction), sand and gravel (industrial), iodine, gypsum.
Oregon	261,000	38	.69	Stone (crushed and broken), sand and gravel (construction), cement (portland), lime, diatomite, gemstones.
Pennsylvania[2]	1,050,000	12	2.81	Stone (crushed and broken), cement (portland), lime, sand and gravel (construction), cement (masonry), stone (dimension).
Rhode Island[2]	29,500	48	.08	Sand and gravel (construction), stone (crushed and broken), sand and gravel (industrial), gemstones.
South Carolina	426,000	30	1.13	Stone (crushed and broken), cement (portland), gold, sand and gravel (construction), clays, cement (masonry).
South Dakota	317,000	36	.84	Gold, cement (portland), stone (crushed and broken), sand and gravel (construction), stone (dimension), lime.
Tennessee	659,000	19	1.75	Stone (crushed and broken), zinc, cement (portland), clays, gemstones, sand and gravel (construction).
Texas	1,660,000	6	4.42	Cement (portland), stone (crushed and broken), sand and gravel (construction), magnesium metal, salt, lime.
Utah	1,840,000	4	4.89	Copper, gold, magnesium metal, molybdenum, salt, potash.

See footnotes at end of table.

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TABLE 3—Continued

VALUE OF NONFUEL MINERAL PRODUCTION IN THE UNITED STATES AND PRINCIPAL NONFUEL MINERALS PRODUCED IN 1995[p 1]

State	Value[p] (thousands)	Rank	Percent of U.S. total	Principal minerals, in order of value
Vermont[2]	67,700	45	.18	Stone (dimension), stone (crushed and broken), sand and gravel (construction), talc and pyrophyllite, gemstones.
Virginia	517,000	24	1.37	Stone (crushed and broken), cement (portland), lime, sand and gravel (construction), kyanite, cement (masonry).
Washington	613,000	20	1.63	Sand and gravel (construction), magnesium metal, stone (crushed and broken), gold, cement (portland), lime.
West Virginia	[r]194,000	40	.51	Stone (crushed and broken), cement (portland), sand and gravel (industrial), salt, lime, sand and gravel (construction).
Wisconsin	[r]441,000	29	1.17	Copper, stone (crushed and broken), sand and gravel (construction), lime, sand and gravel (industrial), gold.
Wyoming	976,000	13	2.60	Soda ash, clays, helium (Grade-A), cement (portland), stone (crushed and broken), sand and gravel (construction).
Undistributed	[r]31,900	—	.09	
Total	37,600,000	XX	100.00	

[p]Preliminary. [r]Revised. XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Partial total, excludes values that must be concealed to avoid disclosing company proprietary data. Concealed values included with "Undistributed" figure.

TABLE 4

VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 1995, BY STATE[p 1]

State	Area (square kilometers)	Population (thousands)	Total value (thousands)	Per capita		Per square kilometer	
				Dollars	Rank	Dollars	Rank
Alabama	134,000	4,220	$676,000	160	16	5,050	24
Alaska	1,530,000	606	594,000	981	4	388	49
Arizona	295,000	4,080	4,180,000	1,030	3	14,100	2
Arkansas	138,000	2,450	452,000	184	14	3,280	31
California	411,000	31,400	2,680,000	85	35	6,520	14
Colorado	270,000	3,660	[r]449,000	123	19	1,670	41
Connecticut	13,000	3,280	[2]80,900	25	49	6,230	17
Delaware	5,290	706	[2]8,900	13	50	1,680	40
Florida	152,000	14,000	1,390,000	99	28	9,130	9
Georgia	153,000	7,060	1,670,000	237	11	11,000	4
Hawaii	16,800	1,180	[2]106,000	90	30	6,330	16
Idaho	216,000	1,130	399,000	352	9	1,850	39
Illinois	146,000	11,800	820,000	70	39	5,620	21
Indiana	93,700	5,750	574,000	100	27	6,120	19
Iowa	146,000	2,830	484,000	171	15	3,320	30
Kansas	213,000	2,550	486,000	190	13	2,280	37
Kentucky	105,000	3,830	401,000	105	26	3,830	27
Louisiana	124,000	4,320	384,000	90	31	3,130	32
Maine	86,200	1,240	58,700	47	41	682	48
Maryland	27,100	5,010	341,000	68	40	12,600	3
Massachusetts	21,500	6,040	213,000	35	46	9,900	6
Michigan	152,000	9,500	1,470,000	154	17	9,660	7
Minnesota	219,000	4,570	1,490,000	326	10	6,810	13
Mississippi	124,000	2,670	125,000	47	42	1,010	46
Missouri	181,000	5,280	1,110,000	210	12	6,130	18
Montana	381,000	856	581,000	679	6	1,530	43
Nebraska	200,000	1,620	142,000	87	33	707	47

See footnotes at end of table.

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TABLE 4—Continued

VALUE OF NONFUEL MINERAL PRODUCTION PER CAPITA AND PER SQUARE KILOMETER IN 1995, BY STATE[p 1]

State	Area (square kilometers)	Population (thousands)	Total value (thousands)	Per capita		Per square kilometer	
				Dollars	Rank	Dollars	Rank
Nevada	286,000	1,460	2,920,000	2,010	2	10,200	5
New Hampshire	24,000	1,140	[2]35,600	31	47	1,480	44
New Jersey	20,200	7,900	289,000	37	45	14,400	1
New Mexico	315,000	1,650	1,080,000	652	7	3,420	29
New York	127,000	18,200	820,000	45	43	6,450	15
North Carolina	136,000	7,070	742,000	105	25	5,440	22
North Dakota	183,000	638	24,500	38	44	134	50
Ohio	107,000	11,100	880,000	79	37	8,220	12
Oklahoma	181,000	3,260	374,000	115	22	2,060	38
Oregon	251,000	3,090	261,000	85	36	1,040	45
Pennsylvania	117,000	12,100	[2]1,050,000	88	32	8,990	10
Rhode Island	3,140	997	[2]29,500	30	48	9,400	8
South Carolina	80,600	3,660	426,000	116	21	5,290	23
South Dakota	200,000	721	317,000	439	8	1,590	42
Tennessee	109,000	5,180	659,000	127	18	6,040	20
Texas	691,000	18,400	1,660,000	90	29	2,400	36
Utah	220,000	1,910	1,840,000	964	5	8,370	11
Vermont	24,900	580	r [2]67,700	117	20	2,720	35
Virginia	106,000	6,550	517,000	79	38	4,900	25
Washington	176,000	5,340	613,000	115	23	3,470	28
West Virginia	62,800	1,820	r194,000	106	24	3,080	33
Wisconsin	145,000	5,080	r441,000	87	34	3,030	34
Wyoming	253,000	476	976,000	2,050	1	3,850	26
Undistributed	XX	XX	r31,900	XX	XX	XX	XX
Total or average	[3]9,370,000	[3]260,000	37,600,000	145	XX	4,010	XX

[p]Preliminary. [r]Revised. XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Partial total, excludes values that must be concealed to avoid disclosing company proprietary data. Concealed values included with "Undistributed" figure.

[3]Excludes Washington, DC (which has no mineral production), with an area of 69 square miles and a population of 570,000.

Sources: U.S. Geological Survey and Bureau of the Census.

TABLE 5

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
ALABAMA							
Cement:							
Masonry	metric tons	277,000	$21,900	312,000	$28,900	306,000	$28,400
Portland	do.	3,750,000	191,000	3,980,000	248,000	4,230,000	264,000
Clays[3]	thousand metric tons	2,490	23,200	2,280	25,400	3,790	35,400
Lime	do.	1,630	89,500	1,660	88,300	1,770	97,200
Sand and gravel:							
Construction	do.	r10,300	r39,100	12,500	47,600	12,100	46,600
Industrial	metric tons	559,000	6,800	610,000	7,160	578,000	7,120
Stone (crushed)	thousand metric tons	28,900	176,000	32,500	164,000	33,400	170,000
Combined value of bauxite, clays (bentonite), gemstones, salt, and stone [dimension (1993, 1995), dimension limestone, marble and sandstone (1994)]		XX	14,900	XX	16,500	XX	27,200
Total		XX	562,000	XX	626,000	XX	676,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
ALASKA							
Gemstones		NA	$10	NA	$10	NA	$10
Gold[4]	kilograms	2,780	32,200	[5]5,740	[5]71,100	[5]5,630	[5]67,600
Sand and gravel (construction)	thousand metric tons	[r]13,100	[r]42,600	15,700	56,200	15,500	56,600
Stone (crushed)	do.	[r]3,530	[r6]25,000	3,870	24,100	4,000	25,000
Combined values of lead, silver, stone [crushed sandstone (1993)], tin (1993), and zinc		XX	[r]292,000	XX	367,000	XX	445,000
Total		XX	[r]391,000	XX	519,000	XX	594,000
ARIZONA							
Clays[3]	thousand metric tons	97	451	98	452	100	463
Copper[4]	metric tons	1,160,000	2,340,000	1,120,000	2,750,000	1,200,000	3,600,000
Gemstones		NA	5,630	NA	3,550	NA	3,760
Gold[4]	kilograms	2,710	31,500	[5]1,980	[5]24,500	[5]1,940	[5]23,300
Iron oxide pigments (crude)	metric tons	77	62	77	62	77	62
Sand and gravel (construction)	thousand metric tons	[r]35,000	[r]138,000	34,800	166,000	37,000	180,000
Silver[4]	metric tons	200	27,700	192	32,600	194	33,100
Stone (crushed)	thousand metric tons	[r]6,240	[r]35,600	4,970	25,000	5,400	27,500
Combined value of cement, clays (bentonite), gypsum (crude), lime, molybdenum, perlite (crude), pumice and pumicite, pyrites[7] (1993), salt, sand and gravel (industrial), and stone [dimension (1993, 1995), dimension sandstone (1994)]		XX	196,000	XX	274,000	XX	309,000
Total		XX	[r]2,770,000	XX	3,280,000	XX	4,180,000
ARKANSAS							
Bromine[e]	metric tons	177,000	123,000	[r]184,000	[r]186,000	207,000	185,000
Clays[3]	thousand metric tons	1,030	2,360	883	2,440	1,050	1,190
Gemstones		NA	5,530	NA	3,950	NA	4,720
Sand and gravel:							
Construction	thousand metric tons	[r]10,100	[r]40,900	10,600	42,500	10,800	44,800
Industrial	metric tons	642,000	7,600	684,000	8,230	684,000	8,230
Silica stone[8]	do.	W	W	[r]510	[r]3,940	264	1,410
Stone:							
Crushed[6]	thousand metric tons	[r]22,200	[r]108,000	20,800	122,000	21,500	128,000
Dimension	metric tons	W	W	W	W	27,200	2,010
Combined value of cement, clays (fire, kaolin), gypsum (crude), lime, stone [crushed dolomite and quartzite (1993), crushed limestone and traprock (1994-95), dimension (1993[r]), dimension limestone, marble, and sandstone)], talc and pyrophyllite (1993), tripoli, and values indicated by symbol W		XX	65,100	XX	68,100	XX	75,500
Total		XX	[r]352,000	XX	437,000	XX	452,000
CALIFORNIA							
Asbestos	metric tons	10,000	4,430	8,990	4,200	9,660	5,130
Boron minerals (B_2O_3)	do.	574,000	373,000	550,000	443,000	546,000	462,000
Cement:							
Masonry	do.	W	W	99,000	6,830	100,000	6,910
Portland	do.	8,510,000	468,000	9,640,000	539,000	9,220,000	515,000
Clays[3]	do.	1,930	26,300	1,570	20,600	3,450	31,600
Gemstones		NA	673	NA	1,710	NA	582

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
CALIFORNIA—Continued							
Gold[4]	kilograms	35,800	415,000	[5]30,100	[5]373,000	[5]29,500	[5]354,000
Lime	thousand metric tons	193	14,800	203	16,900	199	15,000
Rare-earth metal concentrates	metric tons	17,800	W	20,700	W	W	W
Sand and gravel:							
Construction	thousand metric tons	[e]96,300	[e]476,000	96,300	523,000	93,000	512,000
Industrial	metric tons	1,800,000	41,700	1,740,000	39,400	1,650,000	36,200
Silver[4]	do.	14	2,000	11	1,910	11	1,940
Stone:							
Crushed	thousand metric tons	[r]38,200	250,000	41,100	258,000	48,000	307,000
Dimension	metric tons	29,100	6,300	[6]11,100	[6]4,030	33,600	6,460
Combined value of clays [fuller's earth, kaolin (1994-95)], diatomite, feldspar, gypsum (crude), iron ore (usable), magnesium compounds, mercury, perlite (crude), potash, pumice and pumicite, salt, soda ash, sodium sulfate (natural), stone [dimension limestone, sandstone, slate and miscellaneous (1994)], talc and pyrophyllite, titanium (ilmenite), tungsten, and values indicated by symbol W		XX	[r]362,000	XX	[r]364,000	XX	426,000
Total		XX	[r]2,440,000	XX	[r]2,590,000	XX	2,680,000
COLORADO							
Clays	thousand metric tons	281	2,160	291	2,320	288	2,020
Gemstones		NA	258	NA	267	NA	300
Gold[4]	kilograms	W	W	[5]4,420	[5]54,700	[5]4,340	[5]52,000
Sand and gravel (construction)	thousand metric tons	[e]29,000	[e]118,000	29,000	109,000	27,500	106,000
Stone:							
Crushed	do.	10,300	62,000	8,600	53,600	8,200	51,300
Dimension	metric tons	4,320	1,370	[6]3,630	[6]51	W	W
Combined value of cement, copper (1993), gypsum (crude), helium (Grade-A), lead, lime, molybdenum, peat, perlite (1993), sand and gravel (industrial), silver, stone [dimension marble (1994)], zinc, and value indicated by symbol W		XX	216,000	XX	[r]191,000	XX	[r]238,000
Total		XX	399,000	XX	[r]410,000	XX	[r]448,000
CONNECTICUT							
Gemstones		NA	5	NA	5	NA	5
Sand and gravel (construction)	thousand metric tons	[e]6,400	[e]34,900	5,420	28,000	5,300	27,800
Stone (crushed)	do.	[6]4,600	[6]39,500	5,710	51,000	5,900	53,100
Combined value of other industrial minerals		XX	16,200	XX	2,670	XX	(9)
Total		XX	90,700	XX	81,800	XX	[10]80,900
DELAWARE							
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	[e]2,500	[e]10,300	2,580	8,680	2,600	8,900
Total[10]		XX	10,300	XX	8,680	XX	8,900
FLORIDA							
Cement:							
Masonry	metric tons	351,000	27,300	400,000	34,600	393,000	34,000
Portland	do.	4,190,000	211,000	3,370,000	228,000	2,970,000	200,000
Clays[3]	thousand metric tons	407	52,700	430	55,000	363	55,100
Peat	metric tons	219,000	3,780	206,000	3,230	W	W

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
FLORIDA—Continued							
Sand and gravel:							
Construction	thousand metric tons	r22,800	r$73,100	16,600	$60,700	15,800	$59,300
Industrial	metric tons	504,000	5,910	540,000	6,120	591,000	6,050
Stone (crushed)	thousand metric tons	64,900	313,000	r67,000	343,000	66,500	343,000
Combined value of clays (common), gemstones, magnesium compounds, phosphate rock, rare-earth metal concentrates (1993-94), staurolite, stone [crushed dolomite and limestone (1993)], titanium concentrates (ilmenite and rutile), zircon concentrates, and value indicated by symbol W		XX	624,000	XX	639,000	XX	689,000
Total		XX	1,310,000	XX	1,370,000	XX	1,390,000
GEORGIA							
Clays[3]	thousand metric tons	9,660	994,000	9,960	1,060,000	10,700	1,130,000
Gemstones		NA	51	NA	51	NA	51
Sand and gravel:							
Construction	thousand metric tons	r4,600	r16,600	5,520	19,800	5,700	21,400
Industrial	metric tons	491,000	7,940	440,000	7,040	500,000	7,040
Stone:							
Crushed	thousand metric tons	49,400	292,000	54,600	331,000	61,000	381,000
Dimension[6]	metric tons	176,000	18,700	200,000	19,100	217,000	30,200
Combined value of barite, bauxite, cement, clays [fire (1993-94)], feldspar, iron oxide pigments (crude), mica (scrap), and stone [dimension marble (1993), dimension marble and miscellaneous (1994-95)]		XX	101,000	XX	116,000	XX	98,900
Total		XX	1,430,000	XX	r1,550,000	XX	1,670,000
HAWAII							
Cement:							
Masonry	metric tons	7,260	880	6,000	395	4,440	316
Portland	do.	451,000	48,300	404,000	28,300	215,000	15,100
Sand and gravel (construction)	thousand metric tons	W	W	521	4,740	600	5,700
Stone (crushed)	do.	r8,460	r81,400	8,170	82,300	8,500	85,000
Combined value of other industrial minerals		XX	8,140	XX	(e)	XX	(e)
Total		XX	139,000	XX	[10]116,000	XX	[10]106,000
IDAHO							
Gemstones		NA	566	NA	287	NA	349
Phosphate rock	thousand metric tons	4,360	78,400	W	W	W	W
Pumice and pumicite	metric tons	43,400	327	W	W	W	W
Sand and gravel (construction)	thousand metric tons	r13,600	r44,900	14,500	46,300	14,700	49,200
Silver[4]	metric tons	190	26,200	W	W	W	W
Stone (crushed)	thousand metric tons	4,600	20,800	4,160	20,300	4,000	19,400
Combined value of antimony, cement, clays [common (1993), kaolin (1995)], copper, feldspar, [garnet (abrasive), gold, lead, lime, molybdenum (1994-95), sand and gravel (industrial), stone [dimension (1993, 1995), dimension marble and miscellaneous (1994)], vanadium ore, zinc, and values indicated by symbol W		XX	103,000	XX	279,000	XX	330,000
Total		XX	274,000	XX	346,000	XX	399,000
ILLINOIS							
Cement (portland)	metric tons	2,430,000	123,000	2,590,000	151,000	2,600,000	152,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
ILLINOIS—Continued							
Clays[3]	thousand metric tons	477	$1,090	494	$1,170	1,070	$4,140
Gemstones		NA	328	NA	376	NA	269
Sand and gravel:							
Construction	thousand metric tons	[r]34,500	[r]137,000	37,900	150,000	35,000	144,000
Industrial	metric tons	4,220,000	61,700	4,420,000	65,700	4,410,000	65,800
Stone (crushed)[6]	thousand metric tons	61,500	315,000	62,600	353,000	59,500	340,000
Combined value of barite, cement [masonry (1994-95)], clays (fuller's earth), copper, fluorspar, lead (1993-94), lime, peat, silver, stone [crushed sandstone (1993), crushed miscellaneous (1994-95), dimension (1993, 1995), dimension dolomite (1994)], tripoli, and zinc		XX	95,900	XX	102,000	XX	114,000
Total		XX	734,000	XX	823,000	XX	820,000
INDIANA							
Cement (portland)	metric tons	2,060,000	109,000	2,290,000	132,000	2,300,000	133,000
Clays	thousand metric tons	[3]600	[3]2,540	[3]774	[3]2,540	1,090	6,930
Gemstones		NA	47	NA	29	NA	36
Peat	metric tons	24,000	W	23,000	W	W	W
Sand and gravel (construction)	thousand metric tons	[r]27,000	[r]103,000	28,100	108,000	27,900	109,000
Stone:							
Crushed	do.	[r]36,900	[r]166,000	45,900	211,000	48,800	232,000
Dimension	metric tons	[6]156,000	[6]22,900	173,000	25,800	168,000	18,600
Combined value of cement (masonry), clays [ball (1993-94)], gypsum (crude), lime, sand and gravel (industrial), stone [dimension sandstone (1993)], and values indicated by symbol W		XX	70,400	XX	75,400	XX	74,500
Total		XX	[r]473,000	XX	555,000	XX	574,000
IOWA							
Cement (portland)	metric tons	2,300,000	136,000	2,390,000	153,000	2,830,000	181,000
Clays	thousand metric tons	358	1,670	384	1,520	317	1,280
Gemstones		NA	46	NA	50	NA	57
Gypsum (crude)	thousand metric tons	1,990	12,300	2,210	12,700	2,240	12,900
Peat	metric tons	W	W	5,000	W	W	W
Sand and gravel (construction)	thousand metric tons	[r]16,600	[r]64,700	15,300	58,200	14,000	53,900
Stone (crushed)	do.	30,500	169,000	[6]36,600	[6]211,000	[6]37,500	[6]219,000
Combined value of cement (masonry), lime, sand and gravel (industrial), stone [crushed dolomite and miscellaneous (1994-95), dimension], and values indicated by symbol W		XX	13,900	XX	15,400	XX	15,800
Total		XX	398,000	XX	451,000	XX	484,000
KANSAS							
Cement:							
Masonry	metric tons	35,400	2,410	24,000	2,090	20,200	1,760
Portland	do.	1,380,000	73,900	1,640,000	101,000	1,620,000	99,700
Clays	thousand metric tons	[3]513	[3]1,970	[3]556	[3]2,150	656	3,810
Helium:							
Crude	million cubic meters	23	20,400	32	31,400	33	32,700
Grade-A	do.	52	104,000	53	105,000	55	108,000
Salt	thousand metric tons	[11]2,320	[11]103,000	2,660	108,000	2,740	103,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral	1993		1994		1995[p]	
	Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
KANSAS—Continued						
Sand and gravel (construction) thousands metric tons	r11,900	r$30,700	11,200	$29,600	10,400	$28,000
Stone:						
Crushed do.	[6]18,800	[6]90,700	21,500	103,000	20,000	97,000
Dimension[6] metric tons	24,700	2,540	23,700	1,730	20,000	1,340
Combined value of clays [fuller's earth (1993-94)], gemstones, gypsum (crude), pumice and pumicite, salt [brine (1993)], sand and gravel (industrial), and stone [crushed sandstone (1993), dimension sandstone (1993-94)]	XX	12,600	XX	11,900	XX	10,400
Total	XX	442,000	XX	497,000	XX	486,000
KENTUCKY						
Clays[3] thousand metric tons	768	3,060	820	3,460	784	2,590
Sand and gravel (construction) do.	r7,700	r29,900	9,140	32,200	8,500	30,600
Stone (crushed) do.	[6]49,000	[6]226,000	56,300	259,000	49,500	230,000
Combined value of cement, clays (ball), gemstones, lime, and stone [(crushed sandstone (1993)]	XX	128,000	XX	134,000	XX	137,000
Total	XX	388,000	XX	428,000	XX	401,000
LOUISIANA						
Clays thousand metric tons	375	r3,320	371	3,280	384	3,400
Gemstones	NA	141	NA	155	NA	175
Salt thousand metric tons	12,400	115,000	13,500	140,000	13,400	158,000
Sand and gravel:						
Construction do.	r11,900	r51,500	12,300	49,600	13,200	55,400
Industrial metric tons	465,000	9,360	454,000	9,320	454,000	9,320
Stone (crushed) thousand metric tons	W	W	[6]707	[6]7,710	[6]600	[6]6,300
Sulfur (Frasch) do.	740	W	W	W	W	W
Combined value of gypsum (crude), lime, stone [crushed limestone, shell and miscellaneous (1993), crushed shell and miscellaneous (1994-95)], and values indicated by symbol W	XX	54,600	XX	144,000	XX	155,000
Total	XX	r234,000	XX	354,000	XX	387,000
MAINE						
Gemstones	NA	9,690	NA	235	NA	277
Sand and gravel (construction) thousand metric tons	r4,400	r18,900	5,890	24,400	5,000	21,000
Stone (crushed) do.	1,830	10,400	2,740	15,500	2,900	16,900
Combined value of cement, clays (common), peat, and stone (dimension)	XX	21,200	XX	20,900	XX	20,600
Total	XX	60,100	XX	61,000	XX	58,700
MARYLAND						
Cement (portland) metric tons	1,630,000	81,600	1,710,000	90,700	1,680,000	89,300
Clays thousand metric tons	294	705	293	946	313	948
Gemstones	NA	1	NA	1	NA	1
Sand and gravel (construction) thousand metric tons	r11,200	r72,200	8,920	61,200	8,400	58,400
Stone:						
Crushed[6] do.	r21,000	r139,000	24,100	162,000	24,800	169,000
Dimension metric tons	19,300	2,020	18,800	1,550	23,600	1,950
Combined value of other industrial minerals	XX	r11,200	XX	r24,000	XX	21,800
Total	XX	r307,000	XX	r340,000	XX	341,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
MASSACHUSETTS							
Sand and gravel:							
Construction	thousand metric tons	r10,800	r$51,300	12,300	$60,000	10,500	$52,000
Industrial	metric tons	2,000	42	W	W	W	W
Stone:							
Crushed	thousand metric tons	6,460	676,300	10,500	97,300	13,500	128,000
Dimension	metric tons	153,000	21,300	57,300	9,600	W	W
Combined value of clays (common), gemstones, lime, peat, stone [crushed dolomite and miscellaneous (1993)], and values indicated by symbol W		XX	11,300	XX	10,600	XX	32,900
Total		XX	160,000	XX	178,000	XX	213,000
MICHIGAN							
Cement:							
Masonry	metric tons	216,000	17,400	235,000	17,700	238,000	17,900
Portland	do.	5,120,000	313,000	5,160,000	331,000	4,560,000	293,000
Clays	thousand metric tons	1,230	4,850	1,150	3,370	605	3,560
Gemstones		NA	1	NA	2	NA	2
Gypsum (crude)	thousand metric tons	1,690	14,200	1,790	15,300	1,720	15,200
Iron ore (usable)	do.	12,900	W	13,800	W	W	W
Lime	do.	617	30,100	637	33,000	635	33,000
Peat	metric tons	186,000	6,110	156,000	5,090	12187,000	126,570
Sand and gravel:							
Construction	thousand metric tons	r45,000	r158,000	48,800	160,000	53,000	183,000
Industrial	metric tons	2,570,000	25,100	2,870,000	31,300	3,020,000	29,800
Stone:							
Crushed	thousand metric tons	31,000	112,000	35,000	113,000	40,800	141,000
Dimension	metric tons	W	W	6147	635	W	W
Combined values of bromine (1994-95), copper, iron oxide pigments (crude), magnesium compounds, potash, salt, silver, stone [(dimension (1993, 1995), dimension sandstone (1994)], and values indicated by symbol W		XX	823,000	XX	r761,000	XX	743,000
Total		XX	1,500,000	XX	r1,470,000	XX	1,470,000
MINNESOTA							
Gemstones		NA	65	NA	26	NA	26
Iron ore (usable)	thousand metric tons	42,500	1,130,000	43,300	1,160,000	46,600	1,280,000
Peat	metric tons	33,000	1,930	37,000	3,010	W	W
Sand and gravel (construction)	thousand metric tons	r30,500	r85,400	29,500	90,000	34,000	109,000
Stone:							
Crushed	do.	9,420	37,700	10,900	47,100	11,200	49,300
Dimension	metric tons	33,500	11,800	16,900	W	W	W
Combined value of clays (common, kaolin), lime, sand and gravel (industrial), and values indicated by symbol W		XX	35,500	XX	44,900	XX	51,000
Total		XX	1,300,000	XX	1,340,000	XX	1,490,000
MISSISSIPPI							
Clays	thousand metric tons	31,100	334,300	31,190	340,500	31,160	341,000
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	r14,500	r57,300	12,400	53,200	10,800	47,500
Stone (crushed)	do.	2,100	8,120	1,900	7,500	2,200	9,000
Combined value of other industrial minerals		XX	(r)	XX	33,900	XX	27,600
Total		XX	1099,800	XX	135,000	XX	125,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
MISSOURI							
Cement (portland)	metric tons	4,060,000	$201,000	4,730,000	$265,000	3,980,000	$223,000
Clays[3]	thousand metric tons	1,180	7,740	1,250	7,910	1,110	7,190
Copper[4]	metric tons	6,980	14,100	7,720	18,900	8,500	26,000
Gemstones		NA	46	NA	67	NA	58
Iron ore (usable)	thousand metric tons	287	W	W	W	W	W
Lead[4]	metric tons	277,000	194,000	290,000	238,000	289,000	267,000
Sand and gravel:							
Construction	thousand metric tons	r6,400	r19,800	9,760	36,500	8,400	31,900
Industrial	metric tons	520,000	9,390	559,000	9,970	731,000	9,640
Silver[4]	do.	40	5,580	40	6,860	41	6,970
Stone (crushed)	thousand metric tons	53,400	239,000	68,900	330,000	69,500	337,000
Zinc[4]	metric tons	40,200	40,900	42,000	45,600	42,000	49,100
Combined value of barite, cement (masonry), clays [bentonite (1995), fuller's earth], iron oxide pigments (crude), lime, stone [dimension (1993, 1995), dimension granite (1994)], and values indicated by symbol W		XX	123,000	XX	128,000	XX	148,000
Total		XX	855,000	XX	1,090,000	XX	1,110,000
MONTANA							
Clays	thousand metric tons	W	W	r28	W	W	W
Gemstones		NA	281	NA	3,400	NA	1,720
Gold[4]	kilograms	14,300	166,000	r12,600	r156,000	r12,300	r148,000
Lead[4]	metric tons	W	W	9,940	8,140	W	W
Palladium	kilograms	6,500	25,300	6,440	29,400	6,400	29,200
Platinum	do.	1,800	21,400	1,960	25,300	2,000	25,800
Sand and gravel (construction)	thousand metric tons	r10,000	r32,000	7,360	28,800	8,500	34,400
Silver[4]	metric tons	127	17,600	71	12,000	72	12,200
Stone (crushed)	thousand metric tons	2,820	10,400	2,320	8,830	1,900	7,400
Talc and pyrophyllite	metric tons	350,000	11,900	W	W	W	W
Zinc[4]	do.	W	W	21,000	22,800	21,000	24,600
Combined value of barite, cement [masonry (1994-95), portland], clays [bentonite, common, fire (1993-94)], copper, iron ore [usable (1993)], lime, molybdenum, peat, phosphate rock (1993), sand and gravel (industrial), stone (dimension), and values indicated by symbol W		XX	199,000	XX	249,000	XX	298,000
Total		XX	484,000	XX	543,000	XX	581,000
NEBRASKA							
Clays	thousand metric tons	192	932	206	867	222	1,030
Lime	do.	24	1,230	24	904	13	668
Sand and gravel (construction)	do.	r12,900	r41,900	15,000	49,200	16,000	55,200
Stone (crushed)	do.	6,760	38,900	6,890	41,600	6,600	39,600
Combined value of cement, gemstones, and sand and gravel (industrial)		XX	43,200	XX	53,600	XX	45,200
Total		XX	126,000	XX	146,000	XX	142,000
NEVADA							
Barite	metric tons	242,000	9,100	r13284,000	r135,020	447,000	9,600
Clays[3]	thousand metric tons	16	3,430	7	2,860	28	3,380
Copper[4]	metric tons	W	W	6,450	15,800	6,800	21,000
Gemstones		NA	660	NA	160	NA	364
Gold[4]	kilograms	211,000	2,450,000	r214,000	r2,650,000	r210,000	r2,520,000

See footnotes at end table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
NEVADA—Continued							
Sand and gravel:							
Construction	thousand metric tons	r$24,900	r108,000	22,700	$106,000	20,000	$95,000
Industrial	metric tons	480,000	W	572,000	W	640,000	W
Silver[6]	do.	713	98,500	673	115,000	683	116,000
Stone (crushed)	thousand metric tons	1,070	12,500	2,310	20,600	2,500	22,600
Combined value of brucite, cement (portland), clays (fuller's earth, kaolin), diatomite, fluorspar (1993), gypsum (crude), lime, lithium minerals, magnesite, mercury, perlite (crude), salt, and values indicated by symbol W		XX	144,000	XX	r153,000	XX	135,000
Total		XX	2,820,000	XX	r3,070,000	XX	2,920,000
NEW HAMPSHIRE							
Clays	thousand metric tons	3	16	3	16	3	16
Gemstones		NA	9	NA	21	NA	17
Sand and gravel (construction)	thousand metric tons	r4,800	r20,700	7,120	32,600	5,600	25,700
Stone:							
Crushed	do.	1,390	7,790	r1,390	r7,470	r1,800	r9,900
Dimension	metric tons	53,100	8,670	35,300	6,300	W	W
Combined value of other industrial minerals		XX	—	XX	(r)	XX	(r)
Total		XX	37,200	XX	r10 46,400	XX	r10 35,600
NEW JERSEY							
Gemstones		NA	1	NA	1	NA	1
Sand and gravel:							
Construction	thousand metric tons	r14,700	r80,100	16,100	100,000	15,000	93,700
Industrial	metric tons	1,830,000	28,600	1,690,000	30,600	1,710,000	30,100
Stone (crushed)	thousand metric tons	r16,700	r138,000	19,800	154,000	20,600	163,000
Combined value of clays [common, fire (1993)], greensand marl, peat, and stone [crushed sandstone and miscellaneous (1993)]		XX	15,700	XX	4,460	XX	2,960
Total		XX	262,000	XX	289,000	XX	289,000
NEW MEXICO							
Clays[3]	thousand metric tons	33	101	127	269	127	269
Copper[4]	metric tons	224,000	453,000	234,000	574,000	240,000	725,000
Gemstones		NA	10	NA	14	NA	22
Gold[4]	kilograms	995	11,600	W	W	W	W
Potash (K_2O)	thousand metric tons	1,190	216,000	r2,450	r219,000	1,090	200,000
Pumice and pumicite	metric tons	W	W	129,000	1,050	W	W
Sand and gravel (construction)	thousand metric tons	r11,100	r51,100	10,400	47,400	12,300	57,800
Silver[4]	metric tons	22	3,090	22	3,750	22	3,810
Stone (crushed)[6]	thousand metric tons	r3,580	r19,000	3,550	20,000	3,800	21,800
Combined value of cement, clays (fire), gypsum (crude), iron ore (usable), mica (crude), perlite (crude), salt, stone [crushed quartzite (1993), crushed quartzite and traprock (1994-95), dimension (1993, 1995), dimension granite, marble, and miscellaneous (1994)], and values indicated by symbol W		XX	51,200	XX	r65,100	XX	69,800
Total		XX	r805,000	XX	r930,000	XX	1,080,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
NEW YORK							
Cement:							
Masonry	metric tons	75,300	$5,420	82,000	$6,020	111,000	$8,170
Portland	do.	2,970,000	149,000	2,650,000	139,000	2,380,000	125,000
Clays	thousand metric tons	508	9,250	507	9,270	572	12,800
Peat	metric tons	W	W	r/W	12	W	W
Salt	thousand metric tons	5,620	191,000	r/6,060	r/233,000	4,990	190,000
Sand and gravel (construction)	do.	r/34,900	r/162,000	28,000	138,000	26,800	134,000
Stone:							
Crushed	do.	38,400	r/223,000	39,400	239,000	36,500	219,000
Dimension	metric tons	19,300	3,440	r/24,600	r/7,370	36,300	8,830
Combined value of emery (1993), garnet (abrasive), gemstones, gypsum (crude), lead, sand and gravel (industrial), silver, stone [crushed traprock (1993), dimension granite and quartzite (1994)], talc and pyrophyllite, wollastonite, zinc, and values indicated by symbol W		XX	108,000	XX	r/354,000	XX	312,000
Total		XX	852,000	XX	892,000 r/	XX	820,000
NORTH CAROLINA							
Clays[3]	thousand metric tons	2,380	11,200	2,530	12,500	2,250	10,100
Feldspar	metric tons	472,000	16,700	488,000	17,600	483,000	17,700
Gemstones		NA	546	NA	565	NA	4,490
Mica (scrap)	thousand metric tons	51	2,700	68	3,270	68	3,220
Peat	metric tons	W	162	21,000	W	W	W
Sand and gravel:							
Construction	thousand metric tons	r/11,100	r/53,800	11,100	50,700	10,700	50,300
Industrial	metric tons	1,340,000	18,600	1,460,000	24,200	1,460,000	16,100
Stone:							
Crushed	thousand metric tons	r/47,800	r/298,000	r/53,900	r/351,000	57,200	380,000
Dimension	metric tons	31,700	12,300	r/33,700	r/12,500	46,300	14,100
Combined value of clays (kaolin), lithium minerals, olivine, phosphate rock, stone [crushed quartzite, sandstone, slate and miscellaneous (1994), crushed quartzite, slate, and volcanic cinder (1993), dimension quartzite, sandstone, slate, and miscellaneous (1994)], talc and pyrophyllite, and values indicated by symbol W		XX	204,000	XX	r/236,000	XX	246,000
Total		XX	617,000	XX	r/709,000	XX	742,000
NORTH DAKOTA							
Clays	thousand metric tons	W	W	59	W	W	W
Lime	do.	W	4,800	W	6,590	W	W
Peat	metric tons	(14)	W	W	W	W	W
Sand and gravel (construction)	thousand metric tons	r/7,700	r/20,400	6,810	18,500	7,000	20,000
Stone (crushed)	do.	W	W	—	—	—	—
Combine value of clays (common), gemstones, sand and gravel (industrial), stone [crushed volcanic cinder (1993)], and values indicated by symbol W		XX	131	XX	199	XX	4,530
Total		XX	25,300	XX	25,300	XX	24,500
OHIO							
Cement:							
Masonry	metric tons	92,500	11,300	W	W	W	W
Portland	do.	1,490,000	90,300	1,050,000	69,700	926,000	61,200

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
OHIO—Continued							
Clays	thousand metric tons	[3]2,160	[3]$12,000	[3]2,080	[3]$12,500	2,430	$15,200
Gemstones		NA	5	NA	43	NA	43
Lime	thousand metric tons	1,700	101,000	1,850	113,000	2,030	121,000
Sand and gravel:							
Construction	do.	[r]46,400	[r]203,000	47,700	205,000	49,500	220,000
Industrial	metric tons	1,360,000	27,500	1,260,000	27,700	1,270,000	28,000
Stone:							
Crushed	thousand metric tons	51,800	[r]227,000	56,400	251,000	58,500	226,000
Dimension	metric tons	[6]25,700	[6]1,210	W	W	23,600	1,030
Combined value of clays (ball), gypsum (crude), peat, salt, silica stone[5] (1993), stone [dimension limestone (1993), dimension limestone and sandstone (1994)], and values indicated by symbol W		XX	176,000	XX	201,000	XX	208,000
Total		XX	851,000	XX	880,000	XX	880,000
OKLAHOMA							
Cement:							
Masonry	metric tons	85,300	6,720	91,000	7,410	78,000	6,370
Portland	do.	1,700,000	77,600	1,680,000	102,000	1,700,000	103,000
Clays	thousand metric tons	613	2,940	771	3,910	740	4,640
Gypsum (crude)	do.	2,650	15,400	2,890	17,000	2,750	17,500
Iodine (crude)	metric tons	1,940	15,400	1,630	12,800	1,830	19,600
Sand and gravel:							
Construction	thousand metric tons	[r]9,700	[r]27,300	8,480	27,200	8,600	29,200
Industrial	metric tons	1,210,000	23,200	1,230,000	24,000	1,230,000	24,000
Stone:							
Crushed	thousand metric tons	27,100	114,000	29,900	125,000	33,100	146,000
Dimension[6]	metric tons	2,350	838	3,980	1,250	16,300	2,100
Combined value of feldspar, gemstones, lime, salt, stone [dimension limestone and sandstone (1993), dimension sandstone (1994)], and tripoli		XX	14,900	XX	[r]19,400	XX	21,300
Total		XX	298,000	XX	[r]340,000	XX	374,000
OREGON							
Clays	thousand metric tons	221	1,410	240	1,560	240	1,560
Copper[4]	metric tons	703	1,420	106	260	100	300
Gemstones		NA	2,140	NA	2,160	NA	4,270
Nickel ore[15]	metric tons	2,460	W	—	—	1,650	W
Pumice and pumicite	do.	W	W	220,000	2,760	W	W
Sand and gravel (construction)	thousand metric tons	[r]15,800	[r]74,800	18,400	83,600	17,500	81,400
Silver[4]	metric tons	—	—	(7)	10	(7)	10
Stone (crushed)	thousand metric tons	18,900	84,700	18,900	90,100	21,500	105,000
Talc and pyrophyllite	metric tons	64	67	W	W	W	W
Zinc[4]	do.	—	—	118	128	118	138
Combine value of cement (portland), diatomite, emery, gold (1994-95), lime, and values indicated by symbol W		XX	61,600	XX	62,100	XX	68,200
Total		XX	226,000	XX	243,000	XX	261,000
PENNSYLVANIA							
Cement:							
Masonry	metric tons	248,000	18,700	245,000	19,300	236,000	18,600
Portland	do.	5,370,000	283,000	5,630,000	315,000	5,610,000	314,000
Clays	thousand metric tons	765	3,780	811	4,040	919	4,300
Gemstones		NA	1	NA	1	NA	1

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
PENNSYLVANIA—Continued							
Lime	thousand metric tons	1,540	$95,400	1,590	$95,500	1,620	$101,000
Peat	metric tons	9,000	249	10,000	296	[12]15,200	[12]291
Sand and gravel (construction)	thousand metric tons	[r]16,100	[r]83,900	15,900	89,700	15,100	86,800
Stone:							
Crushed	do.	[r6]70,100	[r6]409,000	76,700	462,000	83,500	518,000
Dimension	metric tons	35,700	9,890	[6]43,700	[6]7,280	69,900	12,700
Total		XX	[r]903,000	XX	[r]992,000	XX	1,050,000
RHODE ISLAND							
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	[r]2,500	[r]13,900	2,310	14,200	2,900	18,100
Stone (crushed)	do.	1,290	9,250	1,610	12,200	1,500	11,400
Total[10]		XX	23,200	XX	26,300	XX	29,500
SOUTH CAROLINA							
Cement (portland)	metric tons	2,130,000	109,000	2,210,000	143,000	1,960,000	127,000
Clays	thousand metric tons	1,540	31,300	[3]1,520	[3]30,400	1,530	23,100
Sand and gravel:							
Construction	do.	[r]6,800	[r]21,800	8,600	26,100	9,700	31,000
Industrial	metric tons	749,000	19,000	699,000	18,100	812,000	19,600
Stone (crushed)	thousand metric tons	19,800	121,000	[6]20,000	[6]128,000	[6]21,400	[6]140,000
Combined value of cement (masonry), clays [kaolin (1994)], gemstones, gold, manganiferous ore, mica (scrap), peat, silver, stone [crushed marble (1994-95), dimension (1993, 1995), dimension granite (1994)], and vermiculite		XX	88,700	XX	87,700	XX	85,100
Total		XX	391,000	XX	433,000	XX	426,000
SOUTH DAKOTA							
Gemstones		NA	163	NA	110	NA	173
Gold[4]	kilograms	19,200	223,000	W	W	W	W
Sand and gravel (construction)	thousand metric tons	[r]8,300	[r]25,000	7,700	23,700	6,600	21,100
Silver[4]	metric tons	5	651	4	696	4	707
Stone (crushed)[6]	thousand metric tons	4,230	18,700	5,470	24,500	5,400	24,300
Combined value of cement, clays (common), feldspar, gypsum [crude (1993)], iron ore (usable), lime, mica (scrap), stone [crushed sandstone and miscellaneous (1993), crushed miscellaneous (1994-95), dimension (1993, 1995), dimension granite (1994)], and values indicated by symbol W		XX	69,400	XX	274,000	XX	270,000
Total		XX	337,000	XX	323,000	XX	317,000
TENNESSEE							
Clays[3]	thousand metric tons	607	25,700	665	28,600	653	29,300
Gemstones		NA	21,800	NA	23,100	NA	35,400
Sand and gravel:							
Construction	thousand metric tons	[r]7,200	[r]34,000	8,710	38,000	7,600	33,400
Industrial	metric tons	644,000	11,700	660,000	11,600	768,000	13,200

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
TENNESSEE—Continued							
Stone:							
Crushed	thousand metric tons	43,500	$227,000	49,200	$265,000	52,200	$287,000
Dimension	metric tons	4,550	552	W	W	W	W
Combined value of barite (1994-95), cement, clays [bentonite (1993-94), common, fuller's earth], copper, lead (1993-94), lime, silver, zinc, and values indicated by symbol W		XX	189,000	XX	235,000	XX	261,000
Total		XX	510,000	XX	602,000	XX	659,000
TEXAS							
Cement:							
Masonry	metric tons	245,000	18,400	258,000	18,200	225,000	15,900
Portland	do.	8,130,000	398,000	8,620,000	456,000	8,990,000	475,000
Clays[3]	thousand metric tons	2,180	17,400	2,190	13,700	2,410	17,700
Gemstones		NA	400	NA	448	NA	352
Gypsum (crude)	thousand metric tons	1,760	10,100	1,870	10,100	1,890	9,360
Helium (crude)	million cubic meters	6	5,390	7	7,050	7	7,330
Lime	thousand metric tons	1,370	86,400	1,210	76,200	1,360	87,200
Salt	do.	8,250	76,100	r8,760	r76,500	11,800	99,700
Sand and gravel:							
Construction	do.	r47,100	r195,000	56,700	242,000	55,600	245,000
Industrial	metric tons	1,430,000	28,600	1,570,000	37,900	1,540,000	37,400
Stone (crushed)	thousand metric tons	r71,700	r281,000	76,100	300,000	83,600	343,000
Sulfur (Frasch)	do.	1,160	W	W	W	W	W
Talc and pyrophyllite	metric tons	236,000	5,660	225,000	5,860	286,000	7,600
Combined value of clays (ball, bentonite, fuller's earth, kaolin), fluorspar (1993), helium (Grade-A), iron ore (usable), magnesium compounds, magnesium metal, sodium sulfate (natural), stone [dimension (1993, 1995), dimension granite and limestone (1994)], and values indicated by symbol W		XX	311,000	XX	295,000	XX	316,000
Total		XX	r1,430,000	XX	1,540,000	XX	1,660,000
UTAH							
Beryllium concentrates	metric tons	4,940	5	4,330	5	5,630	6
Clays[3]	thousand metric tons	216	3,130	243	3,410	348	3,850
Gemstones		NA	1,160	NA	620	NA	826
Potash (K_2O)	thousand metric tons	r182	r48,400	W	W	W	W
Salt	do.	2,250	46,800	1,680	56,700	2,400	83,400
Sand and gravel:							
Construction	do.	r16,000	r56,000	21,100	69,600	18,000	61,200
Industrial	metric tons	—	—	—	—	90,700	800
Silver[4]	do.	135	18,700	W	W	W	W
Stone (crushed)	thousand metric tons	4,560	29,400	4,540	19,800	4,300	19,000
Combined value of cement, clays [bentonite, fuller's earth (1993)], copper, gold, gypsum (crude), helium (Grade-A), iron ore (usable), lime, magnesium compounds, magnesium metal, mercury, molybdenum, phosphate rock, sodium sulfate (natural), stone [dimension (1993, 1995), dimension quartzite and sandstone (1994)], and values indicated by symbol W		XX	1,110,000	XX	1,370,000	XX	1,670,000
Total		XX	1,310,000	XX	1,520,000	XX	1,840,000

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
VERMONT							
Asbestos	metric tons	3,660	$1,530	1,130	$920	—	—
Gemstones		NA	1	NA	1	NA	$1
Sand and gravel (construction)	thousand metric tons	r3,000	r10,400	3,890	14,500	2,900	11,000
Stone:							
Crushed	do.	2,520	12,900	4,170	23,700	4,800	27,800
Dimension	metric tons	97,400	27,900	r78,900	r23,200	102,000	28,900
Total[10]		XX	52,700	XX	r62,300	XX	67,700
VIRGINIA							
Cement (portland)	metric tons	W	W	930,000	54,700	827,000	48,600
Clays[3]	thousand metric tons	775	2,950	870	3,250	861	3,210
Lime	do.	756	40,000	742	40,200	834	44,200
Sand and gravel (construction)	do.	r9,000	r40,500	8,060	33,400	8,200	34,800
Stone:							
Crushed	do.	51,000	292,000	56,700	327,000	58,500	342,000
Dimension	metric tons	W	W	r6108	r6 13	W	W
Combine value of cement (masonry), clays [bentonite (1993), fuller's earth], feldspar, gemstones, gypsum (crude), iron oxide pigments (crude), kyanite, sand and gravel (industrial), stone [dimension (1993, 1995), dimension granite and slate (1994)], talc and pyrophyllite, vermiculite, and values indicated by symbol W		XX	88,900	XX	43,600	XX	44,100
Total		XX	465,000	XX	502,000	XX	517,000
WASHINGTON							
Clays[3]	thousand metric tons	238	1,370	246	1,140	242	1,070
Gemstones		NA	24	NA	1,050	NA	208
Gold[4]	kilograms	7,110	82,500	r7,410	r91,800	r7,270	r87,300
Lime	thousand metric tons	213	W	239	W	W	W
Peat	metric tons	W	W	3,000	111	W	W
Sand and gravel (construction)	thousand metric tons	r40,200	r158,000	39,600	165,000	38,000	162,000
Silver[4]	metric tons	14	1,940	W	W	W	W
Stone (crushed)	thousand metric tons	13,200	68,600	15,500	86,100	20,600	118,000
Combined value of cement, clays (fire), diatomite, lead (1993), magnesium metal, olivine, sand and gravel (industrial), stone [dimension (1993, 1995), dimension miscellaneous (1994)], zinc (1993), and values indicated by symbol W		XX	193,000	XX	r225,000	XX	244,000
Total		XX	505,000	XX	r570,000	XX	613,000
WEST VIRGINIA							
Clays	thousand metric tons	115	334	138	291	152	335
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	r1,400	r6,700	1,380	5,970	1,300	5,700
Stone (crushed)	do.	r10,300	79,700	r12,300	99,300	r13,100	107,000
Combined value of cement, lime, peat, salt, sand and gravel (industrial), and stone [crushed dolomite, dimension (1994)]		XX	62,800	XX	75,500	XX	80,100
Total		XX	149,000	XX	181,000	XX	r194,000
WISCONSIN							
Gemstones		NA	45	NA	53	NA	65
Lime	thousand metric tons	511	30,900	507	30,300	543	32,800
Peat	metric tons	W	W	2,000	61	W	W

See footnotes at end of table.

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TABLE 5—Continued

NONFUEL RAW MINERAL PRODUCTION[1] IN THE UNITED STATES, BY STATE[2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
WISCONSIN—Continued							
Sand and gravel:							
Construction	thousand metric tons	r27,600	r$82,800	29,200	$91,500	31,000	$101,000
Industrial	metric tons	1,480,000	31,400	1,630,000	32,400	1,630,000	32,400
Silica stone[8]	do.	W	W	45	80	45	80
Stone:							
Crushed	thousand metric tons	26,200	98,000	28,500	[6]114,000	28,200	[6]114,000
Dimension	metric tons	122,000	13,100	12,500	14,100	128,000	15,600
Combined value of copper, gold,[5] silica stone (1993), silver, stone [crushed quartzite (1994-95], tripoli (1993), and values indicated by symbol W		XX	57,100	XX	126,000	XX	146,000
Total[4]		XX	313,000	XX	409,000	XX	441,000
WYOMING							
Clays[3]	thousand metric tons	2,410	73,400	2,530	91,300	2,590	152,000
Gemstones		NA	13	NA	13	NA	10
Sand and gravel (construction)	thousand metric tons	r3,400	r15,000	3,210	13,100	4,500	18,900
Stone (crushed)	do.	3,460	19,800	5,080	30,000	5,300	31,500
Combined value of cement [masonry (1993), portland (1994-95)], clays (common), gypsum [crude (1994-95)], helium (Grade-A), lime, and soda ash		XX	746,000	XX	746,000	XX	774,000
Total		XX	854,000	XX	880,000	XX	976,000
UNDISTRIBUTED							
Connecticut (1995), Delaware, Hawaii (1994-95), Mississippi (1993), New Hampshire (1994-95), Pennsylvania (1995), Rhode Island, and Vermont		XX	r48,500	XX	r$28,000	XX	31,900

rEstimated. pPreliminary. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data, value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

[5]Placer canvassing discontinued beginning in 1994. May include placer data from other sources.

[6]Excludes certain stones; kind and value included with "Combined value" data.

[7]Pyrites canvassing discontinued beginning in 1994.

[8]Formerly identified as "abrasives." Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

[9]Value excluded to avoid disclosing company proprietary data.

[10]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

[11]Excludes salts in brines; value included with "Combined value" figure.

[12]Data series changed to production beginning in 1995, prior years data may not be comparable.

[13]Excludes certain barites; kind and value included with "Combined value" data.

[14]Less than 1/2 unit.

[15]Production of ferronickel on a contained Ni basis has been as follows: 1993—4,878 metric tons valued at $28.0 million; 1994--the Nickel Mountain Mine was idle; and, in 1995--an estimated 8,200 metric tons valued at $68.0 million.

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TABLE 6

NONFUEL RAW MINERAL PRODUCTION[1] [2] IN THE COMMONWEALTH OF PUERTO RICO AND ISLANDS ADMINISTERED BY THE UNITED STATES

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
PUERTO RICO							
Cement (portland)	metric tons	1,310,000	$72,600	W	W	W	W
Clays	thousand metric tons	155	508	119	$338	140	$370
Lime	do.	—	—	23	2,970	27	3,650
Sand and gravel (industrial)	metric tons	[e]58,000	[e]1,400	W	W	W	W
Stone (crushed)	thousand metric tons	7,850	51,100	10,500	78,400	10,900	80,800
Total		XX	126,000	XX	[3]81,700	XX	[3]84,800
ADMINISTERED ISLANDS							
American Samoa:							
Stone (crushed)	thousand metric tons	83	W	84	W	90	W
Guam: Stone (crushed)	do.	1,370	15,100	2,150	12,700	2,200	13,100
Total[3]		XX	15,100	XX	12,700	XX	13,100

[e]Estimated. [p]Preliminary. W Withheld to avoid disclosing company proprietary data; not included in "Total." XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Total does not include values of items withheld.

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SURVEY METHODS OF NONFUEL MINERALS

By Kenneth W. Mlynarski

Mr. Mlynarski, supervisory statistician with 26 years of Government experience has been involved with the collection and publication of minerals information since 1985.

The U.S. Geological Survey (USGS) Minerals Information Team collects worldwide data on virtually every commercially important nonfuel mineral commodity. These data form the base for tracking and assessing the health of the minerals sector of the U.S. economy.

The USGS data collection activity was instituted by the 47th Congress in an appropriations act of August 7, 1882 (22 Stat. 329), which placed the collection of mineral statistics on an annual basis. The most recent authority for the USGS survey activity is the National Materials and Minerals Policy, Research and Development Act of 1980 (Public Law 96-479, 96th Congress). This act strengthens protection for proprietary data provided to the U.S. Department of the Interior by persons or firms engaged in any phase of mineral or mineral-material production or consumption.

Data Collection Surveys

The USGS begins the collection of domestic nonfuel minerals and materials statistics by appraising the information requirements of Government and private organizations of the United States. Requirements that can be met by collecting data from minerals establishments are posed as questions on USGS surveys. Figure 1 shows a typical survey form.

Specific questions about the production, consumption, shipment, and other activities of mineral commodities are structured in the survey forms to provide meaningful aggregated data. Thus, the entire mineral economic cycle from production through consumption is covered by 144 monthly, quarterly, semiannual, and annual surveys.

After the survey form has been designed, a list of the appropriate establishments to be canvassed is developed. Many sources are used to determine which companies, mines, plants, and other operations should be included on the survey mailing list. State geologists, Federal organizations (e.g., Mine Safety and Health Administration), trade associations, industry representatives, and trade publications and directories are some of the sources that are used to develop and update survey listings. With few exceptions, a complete canvass of the list of establishments is employed rather than a sample survey. The iron and steel scrap industry is one of the exceptions where a sample survey is conducted.

The Paperwork Reduction Act requires that any Government agency wanting to collect information from 10 or more individuals or establishments must first obtain approval from the Office of Management and Budget (OMB). OMB approves the need to collect the data and protects industry from unwarranted Government paperwork.

Survey Processing

The USGS surveys approximately 25,000 establishments. Each year, the USGS mails about 40,000 forms that gather information for 144 different surveys. Each completed survey form returned to the USGS undergoes extensive scrutiny to ensure the highest possible accuracy of the mineral data. The statistical staff monitors all surveys to ensure that errors are not created by reporting in physical units different from the units requested on the form. Relationships between related measures, such as produced crude ore and marketable crude ore, are analyzed for consistency. Engineering relationships, such as recovery factors from ores and concentrates, also are employed. The totals for each form are verified, and currently reported data are checked against prior reports to detect possible errors or omissions.

For the majority of the surveys, which are automated, the forms are reviewed to ensure that data are complete and correct before entering into the computer. The computer is programmed to conduct a series of automated checks to verify mathematical consistency and to identify discrepancies between the data reported and logically acceptable responses.

The USGS is modernizing and automating all of its

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survey processing and data dissemination functions. Automated commodity data system functions include computerized preparation of statistical tables, the use of desktop publishing to integrate text and tables, and electronic dissemination through a bulletin board system and the Internet. Also, information on minerals and mineral-related publications is now available through an easy-to-use automated facsimile (fax) response system known as MINES FaxBack.

Survey Responses.—To enable the reader to better understand the basis on which the statistics are calculated, each commodity annual report includes a section entitled "Domestic Data Coverage." This section briefly describes the data sources, the number of establishments surveyed, the response percentage, and the method of estimating the production or consumption for nonrespondents.

To produce reliable aggregated data, the USGS employs efficient procedures for handling instances of nonresponse. Failure to return the initial survey form results in a second mailing of the form. If the second form is not returned, telephone calls are made to the nonrespondents. The followup calls provide the necessary data to complete the survey forms and/or verify questionable data entries. Periodic visits to minerals establishments also are made by USGS commodity specialists to gather missing data and to explain the importance of the establishment's reporting. By describing the use of the published statistics and showing the impact of nonresponse, the USGS strives to encourage respondents to give a complete and accurate reply.

The OMB "Guidelines for Reducing Reporting Burden" stipulates that the minimum acceptable response rate shall be 75% of the panel surveyed. In addition, the USGS strives for a minimum reporting level of 75% of the quantity produced or consumed (depending on the survey) for certain key statistics. Response rates are periodically reviewed. For those surveys not meeting the minimum reporting level, procedures are developed and implemented to improve response rates.

Estimation for Nonresponse.—When efforts to obtain a response to a survey fail, it becomes necessary to employ estimation or imputation techniques to account for missing data. These techniques are most effective when the response rate is relatively high. Some of the estimation methods depend on knowledge of prior establishment reporting, while other techniques rely on external information to estimate the missing data. When survey forms are received after the current publication has been completed, the forms are edited, necessary imputations are made for missing data, and the survey data base is updated. The revised data are reported in later publications.

Protection of Proprietary Data.—The USGS relies on the cooperation of the U.S. minerals industry to provide the mineral data that are presented in this and other USGS publications. Without a strong response to survey requests, the USGS would not be able to present reliable statistics. The USGS, in turn, respects the proprietary nature of the data received from the individual companies and establishments. To ensure that proprietary rights will not be violated, the USGS analyzes each of the aggregated statistics to determine if the data reported by an individual establishment can be deduced from the aggregated statistics. If, for example, there are only two significant producers of a commodity in a given State, the USGS will not publish the State total because either producer could readily estimate the production of the other. It is this obligation to protect proprietary information that results in the "Withheld" or "W" entries in the published tables. However, if a company gives permission in writing, the USGS will publish the data as long as the data from other respondents are protected from disclosure.

International Data

International data are collected by country specialists and data assistants in the Minerals Information Team. The data are gathered from various sources, including published reports of foreign Government mineral and statistical agencies, international organizations, the U.S. Department of State, the United Nations, the Organization of Petroleum Exporting Countries, and personal contact by specialists traveling abroad. Each February, an annual "Minerals Questionnaire" is sent through the Department of State to more than 70 U.S. embassies asking them to provide estimates of mineral production for the host country for the preceding year. Missing data are estimated by USGS country specialists based on historical trends and on specialists' knowledge of current production capabilities in each country.

Publications

The USGS disseminates current and historical minerals information through a broad range of printed publications.

The Minerals Yearbook summarizes annually, on a calendar-year basis, the significant economic and technical developments in the mineral industries.

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Three separate volumes are issued each year: Volume I, Metals and Minerals; Volume II, Area Reports, Domestic; and Volume III, Area Reports, International. Chapters in Volume I are issued separately as Mineral Industry Surveys (MIS) before the bound volume is available. Volume I of the Minerals Yearbook presents, by mineral commodity, salient statistics on production, trade, consumption, reserves, and other measures of economic activity. Volume II of the Minerals Yearbook reviews the U.S. minerals industry by State and island possessions. Volume III of the Minerals Yearbook contains the latest available mineral data for the year of review on more than 185 foreign countries and discusses the importance of minerals to the economies of these nations.

Mineral Industry Surveys contain timely statistical and economic data on minerals. The surveys are designed to keep Government agencies and the public, particularly the mineral industry and the business community, informed of trends in the production, distribution, inventories, and consumption of minerals. Frequency of issue depends on the demand for current data. Mineral Industry Surveys are released monthly, quarterly, semiannually, or annually.

Mineral Commodity Summaries, an up-to-date summary of about 80 nonfuel mineral commodities, is the earliest Government publication to furnish estimates covering the previous year's nonfuel mineral industry data. It contains information on the domestic industry structure, Government programs, tariffs, 5-year salient statistics, and a summary of international mining news.

Metal Industry Indicators, published monthly, contains indexes that measure the current and future performance of four U.S. minerals industries. For each of the four industries, a composite coincident index and a composite leading index have been developed based on procedures and data similar to those used to construct the U.S. Department of Commerce's coincident and leading cyclical indicators for the national economy.

The Mineral Industry Surveys or the Metal Industry Indicators are available at no charge from Publication Distribution, Cochrans Mill Road, P.O. Box 18070, Pittsburgh, PA 15236, (412) 892-4338.

Minerals Yearbooks and Mineral Commodity Summaries, may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, DC 20402, (202) 783-3238.

Mineral Commodity Summaries also may be purchased from the National Technical Information Service, Springfield, VA 22161, 1-800-553-NTIS (in Virginia and foreign countries: 1-703-487-4650).

Some Minerals Information publications are also available on a CD-ROM format. The CD-ROM is updated on a quarterly basis. It is available from the Government Printing Office at the address and phone number listed above.

Electronic Data Dissemination

In addition to the USGS's printed publications, current Mineral Industry Surveys for all commodities are available through the MINES-DATA bulletin board system. Using this system, the public may obtain information up to 4 weeks before published copies of the reports would arrive in the mail. The system may be accessed by calling (703) 648-7799 using a modem set to 14400 baud, 8 data bits, no parity, and 1 stop bit. Further information on how to use the MINES-DATA system may be obtained from the system operator by calling (703) 648-7943.

Also, current information on minerals and mineral-related publications from the USGS is now available through an easy-to-use automated facsimile response system. The MINES FaxBack service allows callers to retrieve information and order some publications for delivery to their fax machines in minutes, 24 hours per day, 7 days per week. MINES FaxBack makes monthly and quarterly Mineral Industry Surveys publications available to the public at the same time they are forwarded to the printer.

MINES FaxBack works from any Group III-compatible fax machine equipped with a touch-tone telephone (either a built-in handset with touch-tone capability or a separate touch-tone telephone plugged into the fax machine's phone jack). After calling MINES FaxBack, the requestor is guided by a series of voice messages that assist the caller in ordering the desired documents. The caller pays for the phone call that also includes the time needed to deliver the requested document to the caller's fax machine.

To access the MINES FaxBack System, use a touch-tone handset attached to a fax machine or connect a touch-tone telephone to the fax machine's telephone jack and dial (703) 648-4999. Listen to the menu options and select an option using the touch-tone telephone. After completing a selection, press the start button on the fax machine.

The Minerals Information Team also has a page on the World Wide Web detailing its publications, information products, and contacts. To access the page, use Netscape or a similar Web browser. The URL is http://www.minerals.er.usgs.gov/minerals/. The page also contains links to other mining-related pages on the Internet.

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Form 6-1066-M
Fer. (4-96)

A03

FIGURE 1
A TYPICAL SURVEY FORM

UNITED STATES
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY
RESTON, VIRGINIA 20192

IRON ORE (Usable ore)

O.M.B.No. 1032-0006.
Approval Expires: 9/30/98

INDIVIDUAL COMPANY DATA-PROPRIETARY

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Public reporting burden for this collection of information is estimated to average 30 MINUTES per response, including the time for reviewing instructions, searching data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to: U.S. Geological Survey, Statistics and Methods Development Section, Reston, VA 20192; and Office of Information and Regulatory Affairs, Office of Management and Budget, Washington D.C. 20503.

Please complete and return this form in the enclosed envelope by the 15th of the month following the report period. Additional forms are available upon request.

In completing this form, reasonable estimates may be used wherever exact figures are not available. Use zero (0) when appropriate. DO NOT REPORT DECIMALS OR FRACTIONS.

"Collection of non-fuel minerals information is authorized by Public Law 96-479 and the Defense Production Act. This information is used to support executive policy decisions pertaining to emergency preparedness and defense and analyses for minerals legislation and industrial trends. The USGS relies on your voluntary and timely response to assure that its information is complete and accurate."

SECTION 1. Mine or group covered by this report.

Name _____ State _____ County _____

SECTION 2. Stocks, production, and shipments of usable ore for the report month.
Report only ore products as shipped to consumer, such as direct-shipping ore, concentrates, or agglomerates.
Report ores produced in the United States only; do not include imports.

Usable ore (1)	Code	Weight unit Mark (X) one (2)		Physical inventory Adjustment only (3)	Beginning stocks (4)	Production (5)	Shipments (6)	Ending stocks (7)
		Long tons (4)	Metric tons (6)					
Iron ore (Containing less than 5% Mn, natural)	201							

SECTION 3. Please indicate any mines opened or closed by your company during the month. _____

Remarks:

Name of person to be contacted regarding this report			Tel. area code	No.	Ext.
Address	No.	Street	City	State	Zip

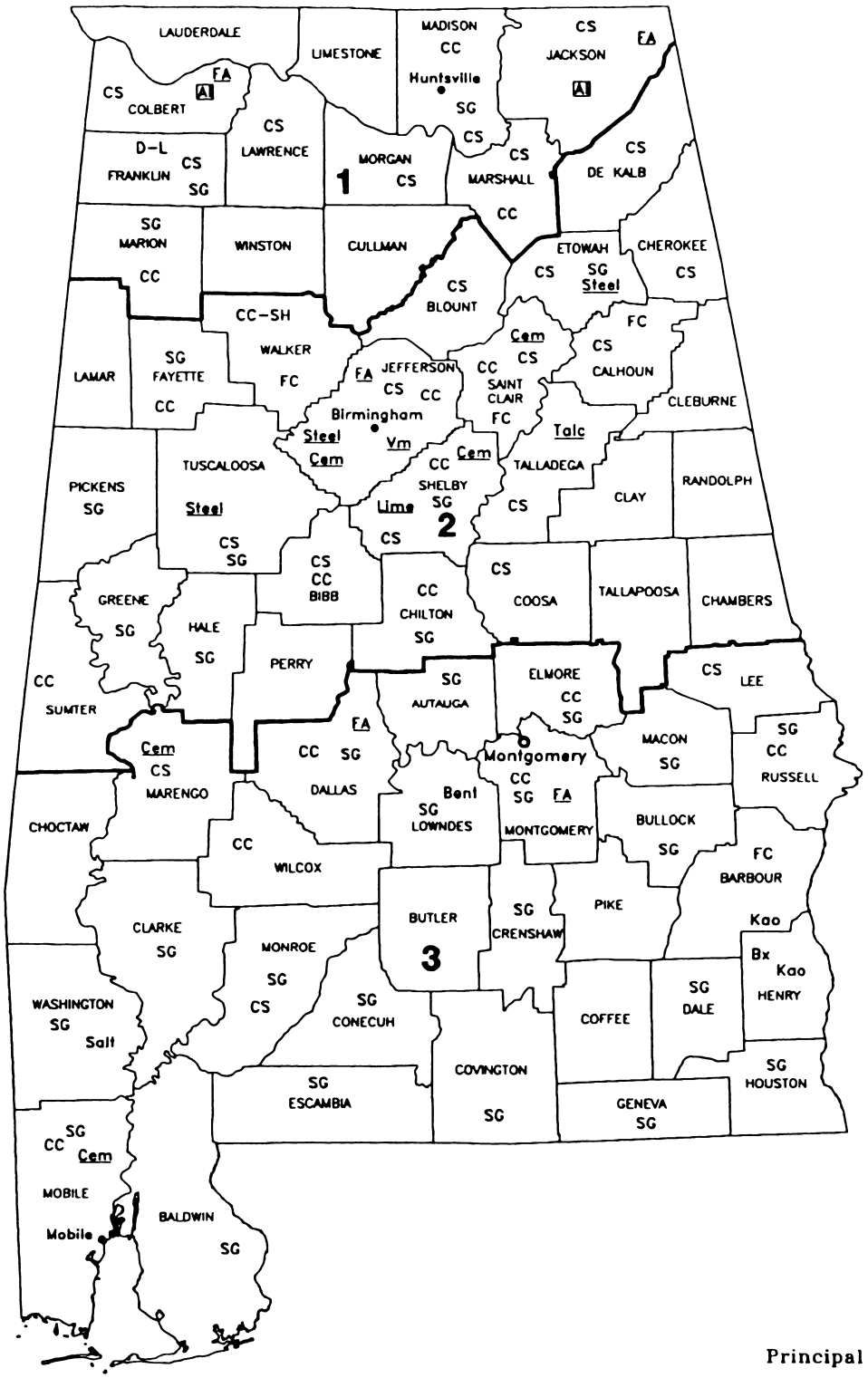
May tabulations be published which could indirectly reveal the data reported above? ☐ (1) Yes ☐ (2) No

Signature	Title	Date

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ALABAMA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

AI	Aluminum plant
Bent	Bentonite
Bx	Bauxite
CC	Common Clay
Cem	Cement plant
CS	Crushed Stone
D-L	Dimension Limestone
FA	Ferroalloys plant
FC	Fire Clay
Kao	Kaolin
Lime	Lime plant
Salt	Salt
SG	Sand and Gravel
Sh	Shale
Steel	Iron and Steel plant
Talc	Talc plant
Vm	Vermiculite plant

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF ALABAMA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Geological Survey of Alabama for collecting information on all nonfuel minerals.

In 1995, for the third consecutive year, Alabama was 18th among the 50 States in nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $676 million, nearly an 8% increase from that of 1994. This followed an 11.5% increase from 1993 to 1994 (based on final data). The State accounted for a little less than 2% of the U.S. total nonfuel mineral production value.

The top four nonfuel mineral commodities produced in Alabama were, in descending order of value, portland cement, crushed stone, lime, and construction sand and gravel; they accounted for close to 86% of the State's total nonfuel mineral value. The combined value of crushed stone and portland cement represented almost 65% of the total. A number of mineral commodities (see table 1), including gemstones, provided significant portions of Alabama's increased nonfuel mineral value in 1995. In 1994, an increase in portland cement was by far the major portion of that year's increase. Compared with 1994, increases occurred in 1995 in portland cement, common clays, lime, crushed stone, gemstones, bauxite, and salt. The values of masonry cement, construction and industrial sand and gravel, and dimension stone decreased

Compared with USGS estimates of the quantities produced in the other 49 States in 1995, Alabama remained first in bauxite, third in fire clays, fourth in masonry cement, fifth in bentonite clays, and eighth in salt. While the State was third in lime, it climbed from third to second in common clays, gemstones, and kaolin clays, and from sixth to fifth in portland cement. In addition, Alabama's stone quarries and sand pits produced substantial quantities of crushed stone and construction and industrial sand and gravel. Nonfuel mineral production in Alabama consisted entirely of industrial minerals; no metals were mined in the State. All metal production, especially that of raw steel, was processed from materials acquired from other domestic and foreign sources. Bauxite that is mined in the State is a natural mixture of bauxitic clay and bauxite that has a very low iron oxide content and is primarily used to make refractory (high temperature resistant) products, rather than to produce primary aluminum.

The Geological Survey of Alabama (GSA)[2] reported that approximately 230 companies or

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ALABAMA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	277,000	$21,900	312,000	$28,900	306,000	$28,400
Portland	do.	3,750,000	191,000	3,980,000	248,000	4,230,000	264,000
Clays[3]	thousand metric tons	2,490	23,200	2,280	25,400	3,790	35,400
Lime	do.	1,630	89,500	1,660	88,300	1,770	97,200
Sand and gravel:							
Construction	do.	e10,300	e39,100	12,500	47,600	12,100	46,600
Industrial	metric tons	559,000	6,800	610,000	7,160	578,000	7,120
Stone (crushed)	thousand metric tons	28,900	176,000	32,500	164,000	33,400	170,000
Combined value of bauxite, clays (bentonite), gemstones, salt, and stone [dimension (1993, 1995), dimension limestone, marble and sandstone (1994)]		XX	14,900	XX	16,500	XX	27,200
Total		XX	562,000	XX	626,000	XX	676,000

[e]Estimated. [p]Preliminary. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

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operations were involved in the mining and production of mineral materials in the State during 1995. According to the GSA, chert, sandstone, shale, and recovered sulfur, in addition to the minerals included in tables 2 and 3, were also produced in Alabama. More limestone and dolomite were produced in the State than any other minerals.

Several new developments occurred in the State's mineral industry during 1995. North Carolina-based Martin Marietta Materials acquired Dravo Corp.'s stone and sand and gravel operations, several of which were in Alabama. This acquisition reportedly made Martin Marietta the second largest aggregate producer in the United States. According to the GSA, Birmingham-based Vulcan Materials Co. remained the largest construction aggregate producer in the country. Vulcan Materials Co.'s new Bessemer quarry began operation in Jefferson County, to meet demand for construction crushed stone in nearby high-growth areas. For fiscal year 1994-95, capital investment in certain expanding mineral industries amounted to $44 million. These expanding industries included marble, refractory clay, lightweight aggregate, talc, lime, and zeolites (artificial).

In July, the Governor signed into law the Alabama Professional Geologists Licensure Act. The new law instituted the regulation and licensing of persons engaged in the public practice of geology. The mining industry was to be represented by one member on the Alabama Board of Licensure for Professional Geologists.

The Alabama Department of Transportation's annual maintenance and construction program involved nearly 11,000 miles of highway. This work represented one of the largest uses of concrete, asphaltic and bituminous base, and aggregate (stone and gravel) in the State, with costs exceeding $500 million per year.

During 1995, the GSA responded to many inquiries for geologic information to be used in mineral exploration, evaluation, development, and educational programs. The GSA also published several reports and maps on Alabama's geology and mineral resources. By yearend, summary minerals reports and maps had been prepared for all 67 counties in Alabama. The GSA published its annual minerals industry summary which provided details of the occurrence, mining history, and general economics of specific mineral resources in Alabama. More information on geology, hydrology, and environmental considerations related to these resources was available from the GSA.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the GSA.

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TABLE 2

ALABAMA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	772	$3,990	$5.17
Filter stone	99	233	2.35
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,700	14,900	4.03
Bituminous aggregate, coarse	2,770	12,400	4.48
Bituminous surface-treatment aggregate	703	3,120	4.43
Railroad ballast	130	577	4.44
Other graded coarse aggregate	1,220	3,210	2.63
Fine aggregate (-3/8 inch):			
Stone sand, concrete	477	2,120	4.43
Screening, undesignated	1,170	4,420	3.76
Other fine aggregates	281	673	2.40
Coarse and fine aggregates:			
Graded road base or subbase	3,390	14,000	4.14
Crusher run or fill or waste	2,420	11,400	4.71
Other coarse and fine aggregates	927	3,400	3.66
Other construction materials[3]	1,820	9,250	5.09
Agricultural:			
Agricultural limestone	141	1,000	7.11
Other agricultural uses[4]	290	2,590	8.92
Chemical and metallurgical:			
Cement manufacture	W	W	2.03
Lime manufacture	W	W	5.51
Dead-burned dolomite manufacture	151	374	2.25
Flux stone	W	W	5.35
Sulfur oxide removal	W	W	3.31
Special:			
Mine dusting or acid water treatment	W	W	27.60
Asphalt fillers or extenders	W	W	27.60
Whiting or whiting substitute	W	W	51.00
Other fillers or extenders	W	W	19.50
Other specified uses not listed	3,810	38,700	10.20
Unspecified:[5]			
Actual	7,440	32,700	4.39
Estimated	756	5,420	7.17
Total	32,500	164,000	5.07

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[1]Includes dolomite, granite, limestone, limestone-dolomite, marble, and slate.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes other coarse aggregates, roofing granules, stone sand (bituminous mix or seal), terrazzo and exposed aggregate, and unpaved road surfacing.

[4]Includes poultry grit and mineral food.

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
ALABAMA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	36	24,900	$107,000	$4.30	34	28,300	$117,000	$4.15
Dolomite	3	W	W	5.89	3	W	W	5.38
Marble	2	W	W	41.40	2	W	W	21.90
Granite	1	W	W	6.58	1	W	W	5.67
Slate	1	W	W	5.61	2	W	W	7.05
Total	XX	28,900	176,000	6.08	XX	32,500	164,000	5.07

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.
[2]Includes "Limestone-dolomite" reported with no distinction between the two.

TABLE 4
ALABAMA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	211	972	844	3,800	—	—
Coarse aggregate, graded[3]	3,530	14,400	4,990	19,800	—	—
Fine aggregate (-3/8 inch)[4]	W	W	W	W	—	—
Coarse and fine aggregate[5]	W	W	W	W	—	—
Other construction materials	4,240	17,600	6,070	27,100	—	—
Agricultural[6]	(7)	(7)	(8)	(8)	—	—
Chemical and metallurgical[9]	—	—	2,740	10,200	—	—
Special[10]	—	—	(8)	(8)	—	—
Other miscellaneous uses[11]	—	—	1,540	31,800	—	—
Unspecified[12]						
Actual	(7)	(7)	(7)	(7)	1,840	8,550
Estimated	253	1,700	504	3,710	—	—
Total	8,570	36,300	22,100	120,000	1,840	8,550

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, riprap and jetty stone, and other coarse aggregate.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.
[6]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[7]Withheld to avoid disclosing company proprietary data; included in "Total."
[8]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[9]Includes cement manufacture, dead-burned dolomite manufacture, flux stone, lime manufacture, and sulfur oxide removal.
[10]Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whiting or whiting substitute.
[11]Includes other specified uses not listed.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

ALABAMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,780	$16,700	$3.50
Plaster and gunite sands	W	W	3.63
Concrete products (blocks, brick, pipe, decorative, etc.)	W	W	2.23
Asphaltic concrete aggregates and other bituminous mixtures	562	2,630	4.67
Road base and coverings[2]	496	1,500	3.02
Fill	210	378	1.80
Railroad ballast	1	3	3.00
Other	115	351	3.05
Unspecified:[3]			
Actual	3,620	16,900	4.68
Estimated	2,750	9,100	3.31
Total or average	12,500	47,600	3.80

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

ALABAMA: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

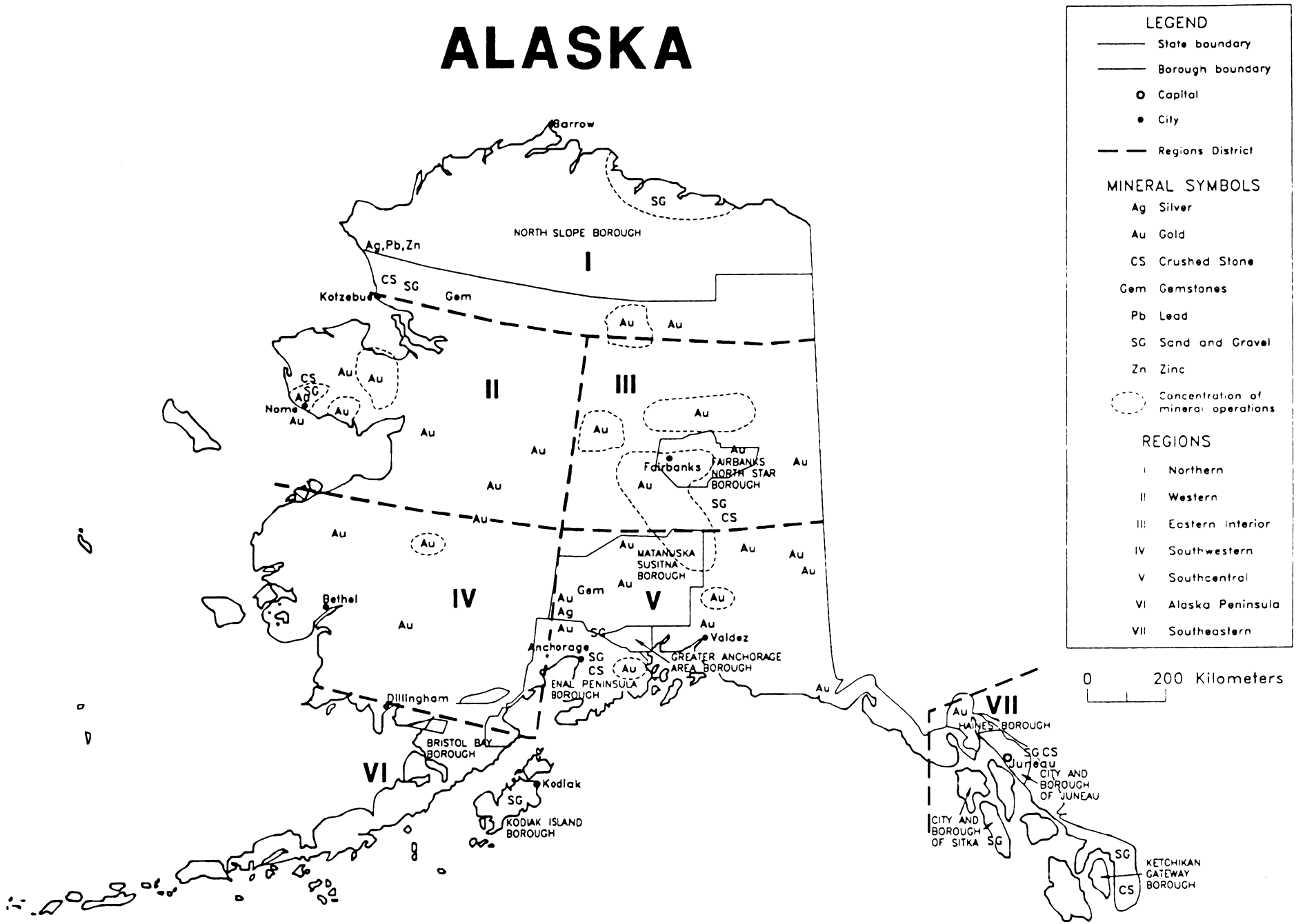
(Thousand metric tons and thousand dollars)

Use	District 2		District 3		Unspecified within all districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	1,310	4,910	3,590	12,200	—	—
Asphaltic concrete aggregates and road base materials[4]	643	2,520	625	1,980	—	—
Railroad ballast	—	—	1	3	—	—
Other miscellaneous uses	—	—	1	3	—	—
Unspecified:[5]						
Actual	983	3,590	2,490	12,700	148	616
Estimated	381	1,270	2,370	7,830	—	—
Total	3,310	12,300	9,070	34,700	148	616

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill and road and other stabilization (lime).
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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ALASKA



Principal Mineral–Producing Localities

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THE MINERAL INDUSTRY OF ALASKA

In 1995, Alaska climbed from 23d to 21st among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $594 million, about a 15% increase from that of 1994. This followed a more than 37% increase from 1993 to 1994 (based on final data). The State accounted for more than 1.5% of the U.S. total nonfuel mineral production value.

Overall, metallic minerals accounted for about 86% of Alaska's total nonfuel mineral production value, while the industrial minerals construction sand and gravel and crushed stone made up most of the remaining 14%. Increases in zinc and lead production at the Red Dog Mine were the main causes for the State's increased mineral value. Compared with 1994, the nonfuel mineral values of zinc, construction sand and gravel, lead, crushed stone, and silver increased in 1995, while gold showed a small decrease.

Based on USGS estimates of the quantities produced in the 50 States during 1995, Alaska remained first in zinc, second in lead, fifth in silver, and seventh[2] of the 14 gold-producing States. Additionally, significant quantities of construction sand and gravel were produced from the State's mine pits. Production of peat was not reported to the USGS, in part because of the seasonal nature of its mining in the State. The Alaska Geological Survey (AGS) estimated production to be about 27,000 cubic meters (35,000 cubic yards) for a nonfuel mineral value of $157,500.

The AGS[3] reported that in 1995 there were many signs of growth and change in the Alaskan mineral industry. Cominco Alaska Inc. continued to increase production of zinc-lead-silver concentrates from the Red Dog Mine in Northwest Alaska. The mine is now recognized as the largest producer of zinc in the world. In 1995, it supplied approximately 8% of the world's mine-produced zinc. Cominco nearly doubled its minable reserves at Red Dog with the discovery of the new Aqqaluk Deposit, about one-third mile (one-half kilometer) north of the currently producing Main Deposit site.

The mill expansion project at the Red Dog Mine and development projects at the Fort Knox (open pit) and the Nixon Fork (underground) gold mines contributed many new jobs to the Alaskan economy. When construction of Fort Knox is completed (anticipated to be late 1996) it will be the State's largest gold mine. Production began at the Nixon Fork gold-copper mine. Greens Creek Mining Co., a Kennecott Corp. subsidiary, announced in November that it would invest $87 million to bring the Greens Creek Mine (zinc-silver-gold-lead), which was mothballed in 1993, back into production by January 1997. By the end of 1995, about 100 employees were working at the mine site. Two major development projects continued in the Southeastern region, Coeur Alaska Inc.'s Kensington Mine and Echo Bay Mines, Alaska Inc.'s Alaska-Juneau (The "A-J") Mine. Both gold mine projects will be fully committed to permitting efforts in 1996.

Fewer job opportunities existed in placer gold

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ALASKA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$10	NA	$10	NA	$10
Gold[3]	kilograms	2,780	32,200	[4]5,740	[4]71,100	[4]5,630	[4]67,600
Sand and gravel (construction)	thousand metric tons	[e]13,100	[e]42,600	15,700	56,200	15,500	56,600
Stone (crushed)	do.	3,530	[5]25,000	3,870	24,100	4,000	25,000
Combined values of lead, silver, stone [crushed sandstone (1993)], tin (1993), and zinc		XX	292,000	XX	367,000	XX	445,000
Total		XX	391,000	XX	519,000	XX	594,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Placer canvassing discontinued beginning 1994. May include placer data from other sources.

[5]Excludes certain stones; kind and value included with "Combined value" data.

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mines and in industrial mineral mines and quarries throughout the State. Gold production declined about 22%, and there were 36 fewer placer mines than in 1994. Cambior Alaska Inc.'s Valdez Creek Mine, the State's largest gold mine for 12 years, closed permanently in September 1995. The placer industry, which employs many rural Alaskans, is expected to stabilize at a lower level of activity in 1996. But overall, mineral-industry-related employment increased 10%, from 3,083 in 1994 to 3,406 in 1995.

Alaska's metal and mineral-based recycling industry continued to grow. In 1995, the dollar value increased by nearly 50%, largely resulting from high ferrous scrap-metal prices in Asian and U.S. West Coast markets.

The State of Alaska, through the Division of Geological and Geophysical Surveys (DGGS), contracted for aeromagnetic geophysical mapping in the Rampart and Manley areas (central Alaska). The results were scheduled for release in the spring of 1996.

For the second year, the State Department of Natural Resources presented reclamation awards to mining firms for exemplary work in returning disturbed ground to useful condition as required by State law. The awards went to 10 placer operators and 1 hardrock mining company. Seven firms received recognition for excellent mine reclamation, while four firms (including Cambior Alaska for the Valdez Creek Mine reclamation) received the distinguished Governor's Award for outstanding reclamation of mined lands.

Every summer, the DGGS publishes a detailed report of the State's mineral industry activities and mineral production for the previous year. *Alaska's Mineral Industry 1995 - Special Report 50* is available to the public and may be obtained by contacting the DGGS as referenced above.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Construction sand and gravel and crushed stone estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]Gold figures in table 1, as reported to the U.S. Geological Survey, possibly understate actual 1993 production and value and overstate 1994 and 1995 production and value. The collection of gold placer mineral production data was discontinued by the U.S. Bureau of Mines (the Federal agency formerly responsible for U.S. nonfuel mineral production data collection) in 1994, and is now independently estimated by the USGS in collaboration with the State. Data collected by Alaska's State government indicate production to have been as follows: 1993—5,949 kilograms, $68.64 million; 1994—5,663 kilograms, $70.29 million; and 1995—4,413 kilograms, $56.04 million. This does not effect Alaska's mineral production ranking among the gold-producing States.

[3]This report includes information provided by the AGS, more formally known as the Division of Geological and Geophysical Surveys of the Alaska Department of Natural Resources.

TABLE 2

ALASKA:[1] CRUSHED STONE[2] SOLD OR USED BY PRODUCERS IN 1994, BY USE[3]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):[4]	50	$110	$2.20
Coarse aggregate, graded:[5]	28	339	12.10
Fine aggregate (-3/8 inch):[6]	20	212	10.60
Coarse and fine aggregates:			
Graded road base or subbase	135	881	6.53
Unpaved road surfacing	3	18	6.00
Crusher run or fill or waste	5	55	11.00
Other coarse and fine aggregates	4	29	7.25
Unspecified:[7]			
Actual	400	1,190	2.98
Estimated	3,230	21,300	6.61
Total	3,870	24,100	6.24

[1]Data derived in part from the Alaska Geological Survey.
[2]Includes granite, miscellaneous stone, sandstone, slate, and traprock.
[3]Data are rounded to three significant digits; may not add to totals shown.
[4]Includes riprap and jetty stone and other coarse aggregates.
[5]Includes concrete aggregate (coarse) and bituminous aggregate (coarse).
[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).
[7]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

ALASKA:[1] CRUSHED STONE SOLD OR USED, BY KIND[2]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Traprock	r7	r1,030	r$4,880	r$4.75	8	1,280	$5,520	$4.30
Sandstone	(3)	(3)	(3)	(3)	2	W	W	2.39
Granite	4	172	1,320	7.69	2	W	W	10.40
Slate	1	19	90	4.74	1	7	48	6.86
Miscellaneous stone	15	r2,310	r18,700	r8.07	12	2,480	18,000	7.25
Total	XX	r3,530	r25,000	r7.07	XX	3,870	24,100	6.24

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data derived in part from the Alaska Geological Survey.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes sandstone from State total to avoid disclosing company proprietary data.

TABLE 4

ALASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

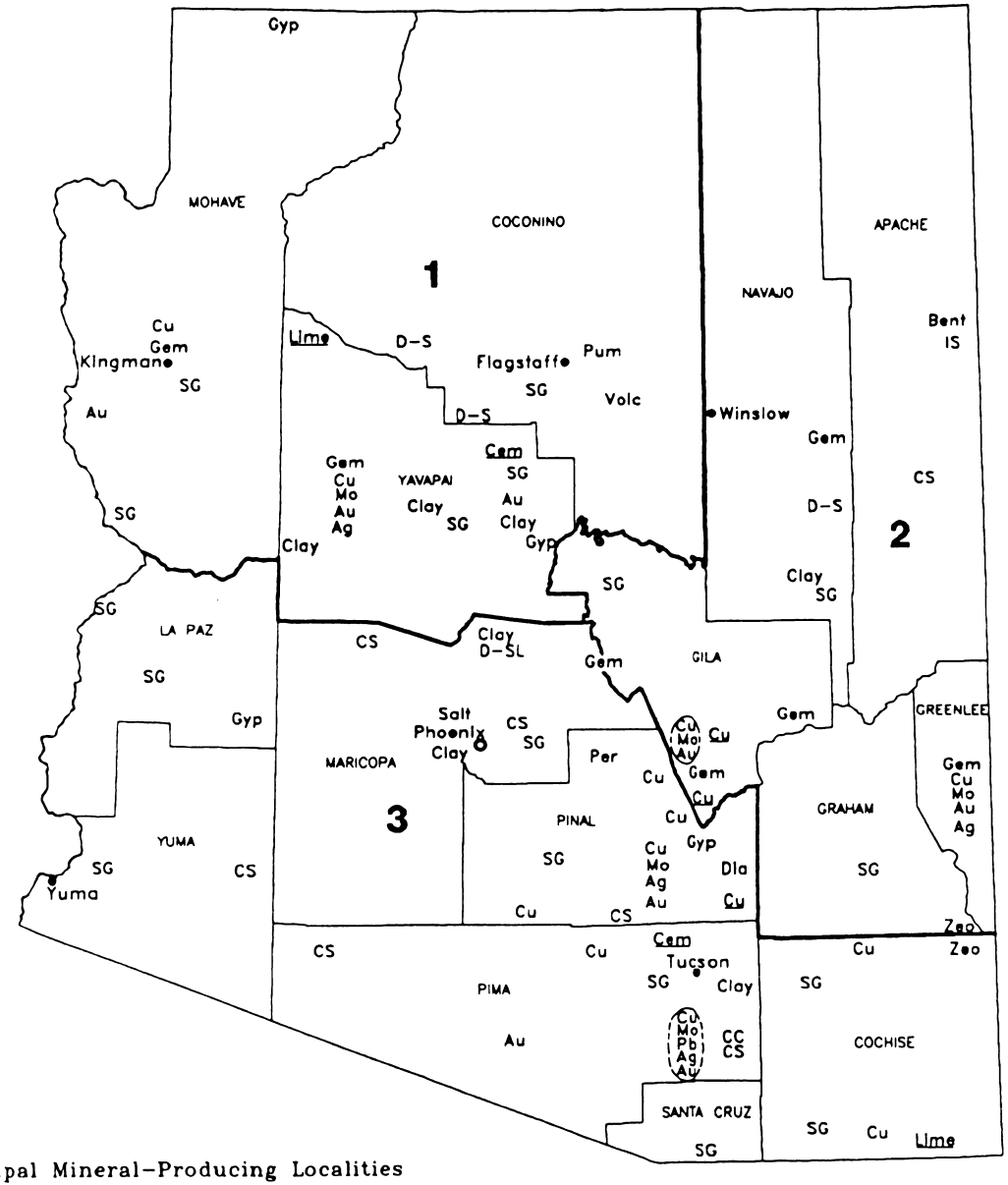
Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	245	$1,660	$6.77
Concrete products (blocks, brick, pipe, decorative, etc.)	33	213	6.45
Asphaltic concrete aggregates and other bituminous mixtures	276	3,160	11.50
Road base and coverings	1,240	5,530	4.47
Fill	845	3,480	4.12
Snow and ice control	30	234	7.80
Railroad ballast	49	300	6.12
Other	298	2,070	6.95
Unspecified:[2] Estimated	12,700	39,600	3.12
Total or average	15,700	56,200	3.58

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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ARIZONA



Principal Mineral-Producing Localities

LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Au	Gold
Bent	Bentonite
Cem	Cement plant
Clay	Clay
CC	Calcium Carbonate
CS	Crushed Stone
Cu	Copper
Cu	Copper plant
D-S	Dimension Sandstone
D-SL	Dimension Slate
Dia	Diatomite
Gem	Gemstones
Gyp	Gypsum
IS	Industrial Sand
Lime	Lime plant
Mo	Molybdenum
Pb	Lead
Per	Perlite
Pum	Pumice
Salt	Salt
SG	Sand and Gravel
Volc	Volcanic cinder
Zeo	Zeolite
	Concentration of mineral operations

0 100 Kilometers

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THE MINERAL INDUSTRY OF ARIZONA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Arizona Department of Mines and Mineral Resources for collecting information on all nonfuel minerals.

In 1995, for the seventh time in the past 8 years, Arizona led the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). Arizona's portion of the U.S. total (based on preliminary data) was $4.2 billion, a 27% increase from the $3.3 billion achieved in 1994. This followed an 18% increase in 1994 from that of 1993 (based on final 1994 data). The State accounted for more than 11% of the U.S. total nonfuel mineral production value.

Arizona continued as the top copper-producing State, accounting for 63% of total U.S. copper production. A decrease in 1993 and increases (see table 1) in 1994-95 in the State's total nonfuel mineral value were mainly the result of fluctuations in copper prices. Overall, copper represented 87% of Arizona's 1995 nonfuel mineral production value; industrial minerals, more than 8%; and the remaining 5% was divided between molybdenum, silver, and gold. Compared with 1994, the values of the following commodities increased in 1995: copper, construction sand and gravel, molybdenum, silver, lime, crushed stone, salt, masonry cement, gemstones, pumice, bentonite clays, perlite, dimension stone, industrial sand and gravel, and common clays. The values of portland cement, gold, and gypsum showed slight decreases during the year.

Based on USGS estimates of the quantities of minerals produced in the United States during 1995, Arizona remained first in copper and molybdenum; second in silver and perlite; and fifth in the production of pumice and iron oxide pigments. While the State remained 11th of 14 gold-producing States, Arizona climbed from 7th to 6th in the production of construction sand and gravel and from 11th to a tie for 10th with New Mexico in gypsum production. The State dropped from eighth to ninth in bentonite clay production. Additionally, Arizona mines and manufacturing plants produced significant quantities of portland and masonry cements and dimension stone,

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ARIZONA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	97	$451	98	$452	100	$463
Copper[4]	metric tons	1,160,000	2,340,000	1,120,000	2,750,000	1,200,000	3,600,000
Gemstones		NA	5,630	NA	3,550	NA	3,760
Gold[4]	kilograms	2,710	31,500	[5]1,980	[5]24,500	[5]1,940	[5]23,300
Iron oxide pigments (crude)	metric tons	77	62	77	62	77	62
Sand and gravel (construction)	thousand metric tons	[e]35,000	[e]138,000	34,800	166,000	37,000	180,000
Silver[4]	metric tons	200	27,700	192	32,600	194	33,100
Stone (crushed)	thousand metric tons	6,430	36,800	4,970	25,000	5,400	27,500
Combined value of cement, clays (bentonite), gypsum (crude), lime, molybdenum, perlite (crude), pumice and pumicite, pyrites[6] (1993), salt, sand and gravel (industrial), and stone [dimension (1993, 1995), dimension sandstone (1994)]		XX	196,000	XX	274,000	XX	309,000
Total		XX	2,780,000	XX	3,280,000	XX	4,180,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.
[4]Recoverable content of ores, etc.
[5]Placer canvassing discontinued beginning 1994.
[6]Pyrites canvassing discontinued beginning 1994.

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although not ranking among the top 10 States.

The remainder of this report was derived from information provided by the Arizona Department of Mines and Mineral Resources (ADMMR). The copper producer price averaged a record high $1.38 per pound for 1995, up significantly from the 1994 average of $1.11. Byproduct molybdenum concentrate prices also surged during the year from $2.00 per pound in mid-1994 to $5.50 in mid-1995 before settling to about $3.00 at yearend. These factors combined to stimulate production of these minerals and enabled State producers to achieve high earnings from their operations. Six companies operating 16 copper properties produced a record estimated 1.2 million metric tons[2] (2.6 billion pounds) in 1995. This marked the fourth consecutive year of record-breaking copper mine production; in 1992, Arizona's mines produced 1.15 tons of recoverable copper, surpassing the State's alltime record copper production of 1.04 tons set in 1981. The State's high levels of copper production in recent years have been, in part, the result of ongoing company investments in mine truck and shovel fleets, mill expansions, and smelter improvements.

Copper

ASARCO Incorporated drove a decline (underground roadway) from the base of the Mission Complex pit to develop a high-grade, 4.5-million-ton underground deposit. At the Santa Cruz in situ project, research partners Asarco, Freeport-McMoran Copper & Gold Inc., and the U.S. Bureau of Mines received the necessary permits and completed construction of a pilot-scale solvent-extraction electrowinning (SX-EW) copper refining plant. Injection of sulfuric acid into the deposit was begun to dissolve the copper from the ore and produce a copper-bearing leachate solution. The leachate will be pumped from recovery wells and processed through the SX-EW plant to produce copper cathode.

With the addition of a water flush crusher, mill production of copper ore at Cyprus Climax Metals Co.'s Bagdad Mine reached 76,900 tons per day. A redesign of Cyprus Miami Mining Corp.'s smelter off-gas hood allowed the company to achieve its 590,000-ton-per-year capacity at the Miami smelter operation. An $80 million investment in a new electrolytic refinery at Miami for refinery capacity made Cyprus self-sufficient and lowered refining costs by 2 cents per pound. In April, the final environmental impact statement (EIS) was issued for the Cyprus Tohono Corp. operations, thus allowing its conversion from in situ leaching to an open pit heap-leach operation. The precipitate plant at Cyprus' Mineral Park Mine was replaced with an SX-EW unit.

In December, Broken Hill Proprietary Co. (BHP) of Australia submitted a proposal to acquire Magma Copper Co. for $1.8 billion. The acquisition was completed the following month including the necessary inclusion of Magma debt of $600 million for a total transaction cost of $2.4 billion. The merger will create a new BHP copper group headed by Magma personnel. Development continued on Magma's Kalamazoo deposit, with the tunnel boring project completed in December. Production was expected to begin during 1997 and be phased in over a 2-year period as the adjacent San Manuel deposit nears depletion. The nearby, geologically related Kalamazoo deposit will be accessed from the current shaft at San Manuel and is expected to extend the life of the San Manuel underground mine by 12 years to the year 2009.

Completion of the Southside expansion at Phelps Dodge Corp.'s Morenci Mine increased annual SX-EW capacity by 68,000 to 226,000 tons (150 to 500 million pounds). Previously, in 1994, the company reported drilling a portion of the new Garfield deposit that then added 687 million tons (760 million short tons) to the Morenci copper reserve.

In May, Azco Mining Inc. agreed to sell its Sanchez copper deposit near Safford, Graham County, to Phelps Dodge. Azco's stockholders gave final approval to the transaction in December. This added to Phelps Dodge's Safford District properties. In 1994, the company had previously announced its acquisition and subsequent drilling of the San Juan deposit, thereby identifying a leachable resource of 250 million tons. Total leachable copper resources for Phelps Dodge at Safford, including Sanchez and San Juan, now exceed 2.2 billion tons. Work on a land exchange involving the U.S. Bureau of Land Management was underway to facilitate development of the projects.

Tonto National Forest officials issued a draft EIS in January for Cambior (USA) Inc.'s Carlotta project. The company anticipates receiving a final EIS in early 1996, allowing construction of the open pit mine, heap-leach pad, and 24,000-ton-per-year copper SX-EW recovery plant.

Gold and Construction Sand and Gravel

Two gold deposits were under development in 1995: Combined Metals Reduction Co.'s Klondyke/Golden Door property as a heap-leach operation in Mohave County and Gold Chord

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Resources Inc.'s underground Evening Star operation, in Maricopa County. In addition to gold and relatively small quantities of copper, the Evening Star deposit contains significant quantities of silica of sufficient purity to serve as a source of smelter flux for nearby copper refineries. In metal refining, a flux is a material that is used to remove undesirable materials as a molten material; e.g. silica is used in copper refining to remove iron oxide.

Population growth and freeway construction projects in the metropolitan Phoenix area have contributed to Arizona's ranking sixth nationally in construction sand and gravel production. Salt River Sand and Rock, Maricopa County, was reported by ADMMR to be the second largest operation in the Nation.

ADMMR compiled its *Directory of Active Mines in Arizona 1996*. The directory provides a detailed listing of companies, mines, and personnel, as well as a summary of Arizona's mining industry.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS data are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

TABLE 2

ARIZONA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	152	$1,170	$7.70
Other coarse aggregate	6	38	6.33
Coarse aggregate, graded:			
Bituminous aggregate, coarse	6	51	8.50
Railroad ballast	76	663	8.72
Coarse and fine aggregates:			
Graded road base or subbase	78	271	3.47
Unpaved road surfacing	25	142	5.68
Terrazzo and exposed aggregate	71	733	10.30
Crusher run or fill or waste	1	8	8.00
Other coarse and fine aggregates[3]	130	803	6.18
Agricultural: Poultry grit and mineral food	W	W	11.60
Chemical and metallurgical:			
Cement manufacture	W	W	3.67
Flux stone	W	W	11.60
Special:			
Other fillers or extenders	W	W	11.60
Other specified uses not listed	2,470	9,990	4.04
Unspecified:[4]			
Actual	32	158	4.94
Estimated	1,920	11,000	5.73
Total	4,970	25,000	5.03

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[1]Includes granite, limestone, marble, miscellaneous stone, sandstone and quartzite, traprock, and volcanic cinder and scoria.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes concrete aggregate, coarse, filter stone, and screening (undesignated).

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

ARIZONA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r10	r3,970	r$22,200	r$5.58	8	2,710	$10,500	$3.88
Granite	12	1,760	9,860	5.59	12	1,330	7,870	5.94
Marble	2	W	W	5.74	4	593	3,730	6.28
Trap rock	2	W	W	5.09	4	W	W	5.61
Volcanic cinder and scoria	3	112	r206	r1.83	3	45	94	2.09
Sandstone and quartzite	1	55	782	14.20	2	125	1,550	12.40
Miscellaneous stone	3	251	2,110	8.41	2	W	W	8.47
Total	XX	r6,240	r35,600	r5.71	XX	4,970	25,000	5.03

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.

[1]Data are rounded to three significant digits.

TABLE 4

ARIZONA:[1] CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 3	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	9	53	150	1,160
Coarse aggregate, graded[4]	(5)	(5)	(5)	(5)
Fine aggregate (-3/8 inch)[6]	—	—	(5)	(5)
Coarse and fine aggregate[7]	101	400	123	1,160
Agricultural[8]				
Chemical and metallurgical[9]	(5)	(5)	(5)	(5)
Special[10]	—	—	(5)	(5)
Other miscellaneous uses[11]	(5)	(5)	(5)	(5)
Unspecified:[12]				
Actual	—	—	32	158
Estimated	149	802	1,770	10,200
Total	1,210	3,220	3,760	21,800

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.

[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), and railroad ballast.

[5]Withheld to avoid disclosing company proprietary data; included with "Total."

[6]Includes screening (undesignated).

[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregate.

[8]Includes poultry grit and mineral food.

[9]Includes cement manufacture, and flux stone.

[10]Includes other fillers or extenders.

[11]Includes other specified uses not listed.

[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

ARIZONA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	13,100	$65,900	$5.03
Plaster and gunite sands	157	1,140	7.25
Concrete products (blocks, bricks, pipe, decorative, etc.)	235	1,300	5.52
Asphaltic concrete aggregates and other bituminous mixtures	4,410	31,500	7.15
Road base and coverings[2]	6,070	25,300	4.17
Fill	1,270	4,580	3.62
Snow and ice control	W	W	2.69
Railroad ballast	133	1,120	8.38
Filtration	W	W	15.70
Other	444	2,770	6.23
Unspecified:[3]			
Actual	6,190	19,000	3.07
Estimated	2,770	13,500	4.88
Total or average	34,800	166,000	4.78

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

ARIZONA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

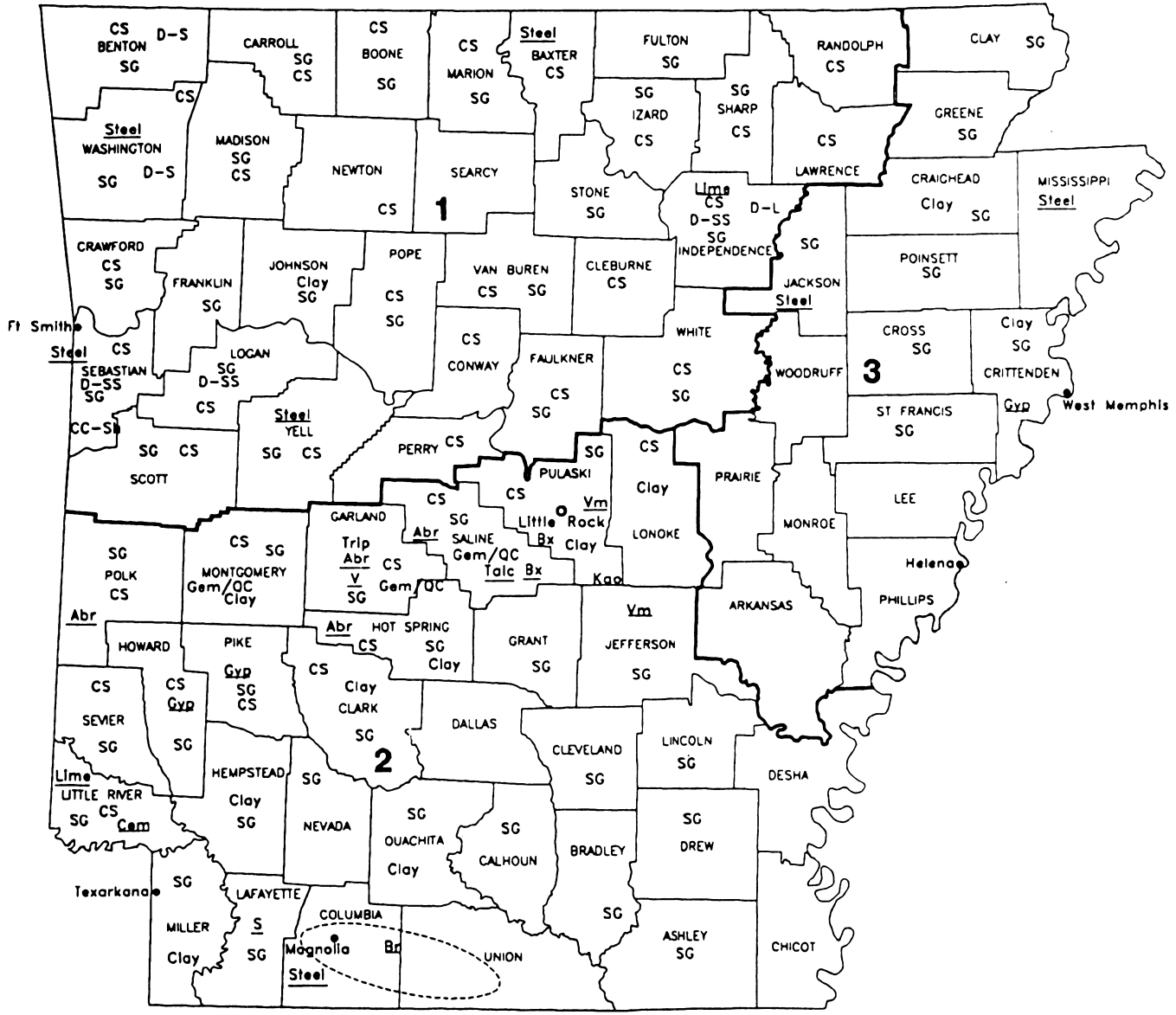
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,170	7,310	318	1,750	12,000	59,300
Asphaltic/bituminous mixtures	678	4,630	375	2,900	[3]3,350	[3]24,000
Road base and coverings[4]	1,970	8,070	357	1,860	[3]3,740	[3]15,400
Fill	420	1,350	103	476	742	2,750
Snow and ice control	W	W	W	W	—	—
Railroad ballast	—	—	W	W	W	W
Other miscellaneous uses	W	W	—	—	W	W
Unspecified:[5]						
Actual	—	—	130	216	6,060	18,800
Estimated	303	1,430	753	3,810	1,720	8,280
Total	4,560	22,900	2,160	11,500	[3]28,100	[3]132,000

W Withheld to avoid disclosing company proprietary data; included with "Total."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes unspecified within all districts.
[4]Includes road and other stabilization (cement and lime).
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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ARKANSAS



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Abr	Abrasives plant
Br	Bromine plant
Bx	Bauxite
Bx	Bauxite plant
CC-Sh	Common Clay & Shale
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-S	Dimension Stone
D-SS	Dimension Sandstone
D-L	Dimension Limestone
Gem/QC	Quartz Crystal
Gyp	Gypsum plant
Kao	Kaolin
Lime	Lime plant
S	Sulfur plant
SG	Sand and Gravel
Steel	Steel plant
Talc	Talc processor
Trip	Tripoli
V	Vanadium plant
Vm	Vermiculite Plant

Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF ARKANSAS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Arkansas Geological Commission for collecting information on all nonfuel minerals.

In 1995, Arkansas rose in rank from 31st to 27th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $451 million, an 11% increase from that of 1994. This followed a 16.8% increase from 1993 to 1994 (based on final data). The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

In 1995, the largest portion of Arkansas increased nonfuel mineral value came from crushed stone. A substantial increase in bromine value and an increase in crushed stone value were responsible for the majority of the State's large rise in value in 1994. The 1994 increase also included a smaller increase in portland cement. Compared with 1994, other mineral commodity values that increased were as follows: construction sand and gravel, portland cement, gemstones, crude gypsum, kaolin clay, tripoli, and masonry cement. Decreases occurred in bromine, lime, silica stone (formerly called abrasives), and common clays.

Based on USGS production estimates for the 50 States during 1995, Arkansas continued to be the leading bromine-producing State, accounting for most U.S. production. Michigan was the only other State that produced bromine. Mining operations in both States extracted subsurface bromine-rich natural brines by submersible pump for subsequent processing. Arkansas also remained first of two silica stone-producing States, third in tripoli, fourth in kaolin and fire clays, and ninth in crude gypsum. The State rose from 10th to 9th in common clays. Because of the difficulty in establishing a common physical unit that properly measures quantities of gemstones produced, gem production is measured in dollars. By value, Arkansas dropped from second to third in gemstone

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ARKANSAS[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Bromine[e]	metric tons	177,000	$123,000	[r]184,000	[r]$186,000	207,000	$185,000
Clays[3]	thousand metric tons	1,030	2,360	883	$2,440	1,050	1,190
Gemstones		NA	5,530	NA	3,950	NA	4,720
Sand and gravel:							
Construction	thousand metric tons	[e]10,100	[e]40,900	10,600	42,500	10,800	44,800
Industrial	metric tons	642,000	7,600	684,000	8,230	684,000	8,230
Silica stone[4]	do.	W	W	[r]510	[r]3,940	264	1,410
Stone:							
Crushed[5]	thousand metric tons	[r]22,200	[r]108,000	20,800	122,000	21,500	128,000
Dimension	metric tons	W	W	W	W	27,200	2,010
Combined value of cement, clays (fire, kaolin), gypsum (crude), lime, stone [crushed dolomite and quartzite (1993), crushed limestone and traprock (1994-95), dimension (1994), dimension limestone, marble, and sandstone)], talc and pyrophyllite (1993), tripoli, and values indicated by symbol W		XX	65,100	XX	68,100	XX	75,500
Total		XX	[r]352,000	XX	437,000	XX	451,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Formerly identified as "Abrasives." Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

[5]Excludes certain stones; kind and value included with "Combined value" data.

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production. In addition, the State mine pits and quarries produced significant quantities of construction and industrial sand and gravel, crushed stone, and dimension stone. The State's mines exclusively produced industrial minerals; no metal mining has been reported in Arkansas since 1991, when bauxite and vanadium ore mining ceased following decades of production. The State's metal production, mostly raw steel, resulted from materials received from other domestic and foreign sources.

The Arkansas Geological Commission[2] (AGC), reported that the Arkansas Legislature, in response to increasing environmental concerns, passed Act 1345 of 1995 to amend parts of the Arkansas Open-Cut Land Reclamation Act (Act 827 of 1991). Act 1345 prevents the mining of gravel from Arkansas stream beds designated as "extraordinary resource waters." Under the Act, existing permitted gravel mining operations on such waters are allowed to continue for a period of 2 years, after which they must cease operations and reclaim the affected area under the operator's approved reclamation plan. Gravel operations at streams not classified as extraordinary resource waters are unaffected.

In Union County, a proposed 25,000-hectare (60,000-acre) brine extraction unit for bromine production was the subject of a growing controversy. A key issue in the dispute, part of which was to be addressed in the U.S. District Court, involved the determination of adequate royalty compensation to landowners for the bromine extracted from the so-called "West Plant Unit." The controversy involves Great Lakes Chemical Corp. and about 1,000 landowners, including the El Dorado-based energy firm Murphy Oil Corp. whose subsidiary, Deltic Farm & Timber Co., holds about 4,900 hectares (12,000 acres) in the proposed unit. Great Lakes currently owns two active production units in Union and Columbia Counties totaling 30,000 hectares (70,000 acres). The Arkansas Oil and Gas Commission must approve the new unit before production can begin.

Capricorn Diamonds, Ltd. of Australia announced that it was dropping out of an exploration project at Crater of Diamonds State Park, leaving only two Texas companies—Arkansas Diamond Development Corp. of Dallas and Texas Star Resources Corp. of Houston—to continue with Phase II of the project. Initial environmental studies were being conducted to obtain a U.S. Department of the Interior (DOI) temporary noncompliance use permit. Drill and trench sampling were allowed by a DOI ruling in early 1995 because these activities "did not constitute mining." Separately, Texas Star shut down its diamond exploration program and testing plant near Murfreesboro, but retained its properties there.

In industry news, McGeorge Construction Co. of Little Rock custom-mined a small tonnage of bauxite on Aluminum Company of America property in Saline County. Also, work was underway to dismantle and remove Holnam Inc.'s Okay Cement manufacturing plant facilities, which closed in 1993. Reclamation of Holnam's Howard County mine site, which was a source of the Okay plant's raw materials, will be reclaimed and become part of Lake Millwood. Meridian Aggregates Co. of Engelwood, CO, which bought out all of Boorhem-Fields Inc.'s crushed stone operations in Arkansas 2 years ago, was in the process of obtaining a permit for a formerly active quarry in Independence County, while it continued its gravel operations near Harrell, Calhoun County. Chrisman Inc. opened a new crushed stone quarry at Ratliff in Logan County. Pine Bluff Sand & Gravel Corp. opened the River Mountain quarry, a major crushed stone operation in the Hartshorne Formation, 16 kilometers (10 miles) west of Russellville in Yell County; the quarry is well situated to ship rock by way of the Arkansas River. At Boral Gypsum Co.'s Briar gypsum plant facility in Howard County, stripping operations began on the east side of Nathan-Corinth Road while the mined area west of this road was undergoing reclamation. A silica and high-purity quartz screening facility was sold by the owner, Gary Coleman, but he retained the options at the Butterfield novaculite quarry in Hot Spring County. This site has been a past producer of novaculite for high-silica applications, such as for whetstone production, as well as for crushed stone. Also, Coleman Lasca Products Co., in Garland County was sold to a group of Colorado investors. The company produced the quartz feed material, called lascas, for the manufacture of cultured quartz crystal.

AGC published Information Circular 32, *A Regional Survey of the Distribution of Mercury in the Rocks of the Ouachita Mountains of Arkansas*, presenting base line mercury data on more than 700 samples of varying lithology in central and west-central Arkansas. Another AGC publication, Information Circular 34, *Rare-Earth Elements in the Cason Shale—a Geological Reconnaissance*, reports on the occurrences of rare earths in the Paleozoic phoshorite beds in Independence and Izard Counties. Additionally, AGC geologists continued to map the Cretaceous formations in southwest Arkansas, in part funded through the USGS's STATEMAP program.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Arkansas Geological Commission.

TABLE 2

ARKANSAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	$2.27
Riprap and jetty stone	386	$1,960	5.06
Filter stone	152	772	5.08
Coarse aggregate, graded:			
Concrete aggregate, coarse	828	4,390	5.31
Bituminous aggregate, coarse	220	1,280	5.82
Bituminous surface-treatment aggregate	176	1,150	6.56
Railroad ballast	13	69	5.31
Other graded coarse aggregate	W	W	5.78
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	2.27
Screening, undesignated	373	1,230	3.29
Other fine aggregates	W	W	5.78
Coarse and fine aggregates:			
Graded road base or subbase	2,640	11,200	4.25
Unpaved road surfacing	39	116	2.97
Crusher run or fill or waste	295	1,260	4.26
Other coarse and fine aggregates	W	W	4.91
Other construction materials[3]	2,820	25,900	9.16
Agricultural: Agricultural limestone[4]	196	1,970	10.10
Other specified uses not listed[5]	1,610	6,760	4.21
Unspecified:[6]			
Actual	4,620	21,800	4.71
Estimated	6,460	41,700	6.46
Total	20,800	122,000	5.83

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes granite, limestone, miscellaneous stone and sandstone; excludes dolomite and traprock from State total to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes roofing granules.

[4]Includes poultry grit and mineral food and other agricultural uses.

[5]Includes asphalt fillers or extenders, cement manufacture, lime manufacture, and other fillers or extenders.

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
ARKANSAS: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	18	6,000	$30,500	$5.08	16	6,870	$33,500	$4.87
Granite	8	7,890	41,500	5.26	5	7,090	52,600	7.42
Traprock	r2	r1,550	(2)	(2)	(3)	(3)	(3)	(3)
Sandstone	15	r5,140	r25,400	r4.95	13	5,290	25,300	4.78
Miscellaneous stone	6	1,600	10,300	6.42	5	1,580	10,200	6.43
Total	XX	r22,200	r108,000	r4.86	XX	20,800	122,000	5.83

rRevised. XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes dolomite and traprock (traprock 1993, value only) from State total to avoid disclosing proprietary data.
[3]Excludes value for traprock from State total to avoid disclosing company proprietary data.

TABLE 4
ARKANSAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	223	1,100	325	1,650
Coarse aggregate, graded[4]	W	W	(5)	(5)
Fine aggregate (-3/8 inch)[6]	W	W	(5)	(5)
Coarse and fine aggregate[7]	2,530	W	2,480	(5)
Other construction materials	1,730	19,100	—	—
Agricultural[8]	196	1,970	—	—
Chemical and metallurgical[9]	(5)	(5)	(5)	(5)
Special[10]	(5)	(5)	—	—
Other miscellaneous uses[11]	(5)	(5)	—	—
Unspecified:[12]				
Actual	4,360	20,200	266	1,600
Estimated	820	6,460	5,640	35,300
Total	10,200	52,500	10,700	69,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Excludes dolomite and traprock from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, macadam, and riprap and jetty stone.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Withheld to avoid disclosing company proprietary data; included in "Total."
[6]Includes stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[7]Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.
[8]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[9]Includes cement and lime manufacture.
[10]Includes asphalt fillers or extenders, and other fillers or extenders.
[11]Includes other specified uses not listed.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	4,900	$20,400	$4.17
Asphaltic concrete aggregates and other bituminous mixtures	1,370	6,790	4.95
Road base and coverings	1,070	3,770	3.52
Fill	236	821	3.48
Snow and ice control	2	9	4.50
Filtration	3	5	1.67
Other	158	636	4.03
Unspecified:[3]			
Actual	1,360	4,470	3.29
Estimated	1,510	5,520	3.66
Total or average	10,600	42,500	4.00

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

ARKANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

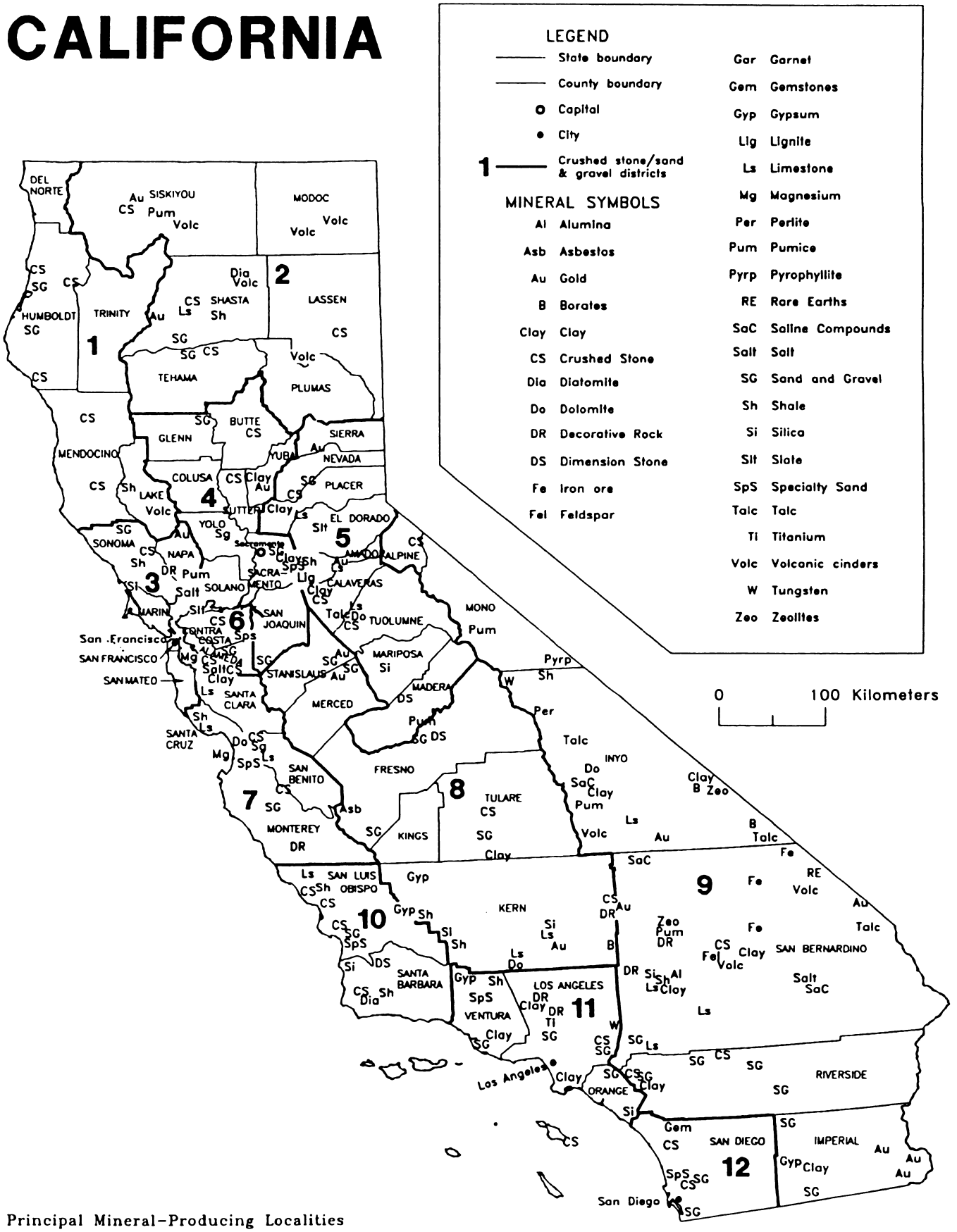
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,620	5,760	3,060	13,700	227	1,010
Asphaltic concrete aggregates and road base materials[3]	754	3,120	1,590	7,040	330	1,220
Other miscellaneous uses[4]	13	51	148	596	1	3
Unspecified:[5]						
Actual	1,030	2,870	8	30	323	1,570
Estimated	82	349	665	3,080	762	2,090
Total	3,500	12,100	5,470	24,400	1,640	5,890

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill.
[4]Includes filtration and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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CALIFORNIA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF CALIFORNIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the California Department of Conservation, Division of Mines and Geology, for collecting information on all nonfuel minerals.

In 1995, for the fourth consecutive year, California was the third leading State in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $2.7 billion, an increase of more than 3% from that of 1994. This followed a 6.5% increase in 1994 from that of 1993 (based on final 1994 data). The State's portion of the U.S. total nonfuel mineral production value was more than 7%. Industrial minerals accounted for almost 87% of the State's nonfuel mineral value; the remaining 13% was metals, mostly gold, silver, and tungsten. Portland cement, construction sand and gravel, boron, and crushed stone were the leading industrial minerals, accounting for more than three-quarters of the State's industrial mineral value. Compared with 1994, the value of the following nonfuel minerals increased: boron, crushed stone, diatomite, rare-earth metal concentrates, soda ash, fuller's earth clays, sodium sulfate, potash, common clays, magnesium compounds, gypsum, masonry cement, dimension stone, asbestos, feldspar, silver, talc and pyrophyllite, and usable iron ore. The value of the following decreased: portland cement, construction and industrial sand and gravel, gold, salt, lime, bentonite clays, kaolin clays, gemstones, and

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN CALIFORNIA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Asbestos	metric tons	10,000	$4,430	8,990	$4,200	9,660	$5,130
Boron minerals (B_2O_3)	do.	574,000	373,000	550,000	443,000	546,000	462,000
Cement:							
Masonry	do.	W	W	99,000	6,830	100,000	6,910
Portland	do.	8,510,000	468,000	9,640,000	539,000	9,220,000	515,000
Clays	do.	1,930	26,300	[3]1,570	[3]20,600	[3]3,450	[3]31,600
Gemstones		NA	673	NA	1,710	NA	582
Gold[4]	kilograms	35,800	415,000	[5]30,100	[5]373,000	[5]29,500	[5]354,000
Lime	thousand metric tons	193	14,800	203	16,900	199	15,000
Rare-earth metal concentrates	metric tons	17,800	W	20,700	W	W	W
Sand and gravel:							
Construction	thousand metric tons	[e]96,300	[e]476,000	96,300	523,000	93,000	512,000
Industrial	metric tons	1,800,000	41,700	1,740,000	39,400	1,650,000	36,200
Silver[4]	do.	14	2,000	11	1,910	11	1,940
Stone:							
Crushed	thousand metric tons	38,200	250,000	41,100	258,000	48,000	307,000
Dimension	metric tons	29,100	6,300	[6]11,100	[6]4,030	33,600	6,460
Combined value of clays [fuller's earth, kaolin (1994-95)], diatomite, feldspar, gypsum (crude), iron ore (usable), magnesium compounds, mercury, perlite (crude), potash, pumice and pumicite, salt, soda ash, sodium sulfate (natural), stone [dimension limestone, sandstone, slate and miscellaneous (1994)], talc and pyrophyllite, titanium (ilmenite), tungsten, and values indicated by symbol W		XX	[r]362,000	XX	[r]364,000	XX	426,000
Total		XX	[r]2,440,000	XX	[r]2,590,000	XX	2,680,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

[5]Placer canvassing discontinued beginning 1994. May include placer data from other sources.

[6]Excludes certain stones; kind and value included with "Combined value" data.

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titanium (ilmenite). Pumice and pumicite and perlite also decreased, but the drop was marginal.

Based on USGS estimates of the quantities of minerals produced in the United States during 1995, California remained the Nation's only State to have boron and tungsten production and became the only State having mine production of rare-earth metal concentrate and asbestos. California remained: first in the production of portland cement, construction sand and gravel, and diatomite; first of two States that produced natural sodium sulfate; second in gold and second of two States that produced soda ash and titanium (ilmenite); third in potash, perlite, and mercury; fourth in pumice; fifth in feldspar; sixth in fuller's earth, gypsum, and talc and pyrophyllite; and seventh in salt and iron ore (usable). While California climbed from 6th to 1st in the production of common clays; 3d to 2d in magnesium compounds; and 14th to 11th in dimension stone; the State dropped from 3d to 4th in industrial sand and gravel and bentonite; 8th to 9th in gemstones (based on value); and 6th to 10th in kaolin clay production. Although being lower in rank than the above mineral commodities, crushed stone was produced in significant quantities in the State's quarries, and lime and masonry cement were produced in manufacturing plants within the State.

According to the California Department of Conservation, Division of Mines and Geology (DMG), siting and permitting of mining operations throughout the State continued to generate some local controversies. The leading issues involved intense land use competition and wide-ranging environmental concerns, as well as the usual noise, dust, and truck-traffic issues in populated areas. The DMG Mineral Land Classification Program continued to provide government agencies with the mineral-resource maps that are necessary in land use planning and mineral conservation studies. Additionally, DMG completed land classification projects in Los Angeles, Orange, Placer, and San Bernardino Counties in 1995.

In the construction aggregate industry, permits for new and expanded sand and gravel operations throughout California were granted in 1995 by city, county, and Federal agencies. A significant new permit was approved for Granite Construction Co., to develop Granite Rock Co.'s Vernalis site in Stanislaus County. The mining of the Vernalis operation will supply about 40.6 million metric tons[2] (45 million short tons) of construction aggregate reserve to the central California region. Construction of a $10 million highway interchange across Interstate 5 was one of the conditions required as part of the permit's approval. Other permits of note were granted to Solano Concrete Co., Inc. and Teichert Aggregates to mine about 48 hectares (120 acres) of construction aggregate adjacent to Cache Creek in Yolo County, and to Owl Rock Product Co. for sand mining along Wilson Creek in Riverside County, the latter permit having been granted late in 1994. An expansion of the Guadalupe Valley (Brisbane) Quarry operated by American Rock and Asphalt Inc. was approved by San Mateo County. Mega Sand Inc., a subsidiary of Taiki Corp., initiated a sand mining operation in the Sacramento River delta in Solano County.

Gold production in California accounted for more than 95% of the State's total metallic mineral value. Homestake Mining Co.'s McLaughlin Mine in Lake, Napa, and Yolo Counties continued as the leading gold producer in California, followed closely by Santa Fe Pacific Gold Corp.'s Mesquite Mine in Imperial County. Viceroy Resources Corp. celebrated a milestone with the pouring of its 500,000th troy ounce (15,500 kilograms) of gold bullion at its Castle Mountain Mine in San Bernardino County. The mine had been producing for about 3 1/2 years. Siskon Gold Corp.'s San Juan Ridge underground mine began production in 1995; reserves were estimated at about 9,300 kilograms (300,000 troy ounces). Canyon Resources Corp. received county and Federal approval for mining at the Briggs Mine site in Inyo County. The mine is expected to produce about 20,000 kilograms (650,000 troy ounces) of gold during its anticipated 7-year life span, with mining expected to commence in mid-1996. Siskon Gold Corp.'s Big Horn Mine in San Bernardino County was granted a permit to mine by the county's Board of Supervisors, but a successful appeal by the Mojave Water Agency against the mine's proposed processing plant in the city of Adelanto has placed the project on hold. Glamis Gold Ltd. announced a new gold discovery located at a site of about 640 hectares (1,600 acres) in Imperial County. Glamis reported that the property contained about 81 million tons (90 million short tons) of ore averaging 0.58 grams of gold per ton (0.017 troy ounces per short ton). Completion of the project's final feasibility report was expected by spring 1996.

Production of tungsten continued at Avocet Tungsten, Inc.'s Pine Creek Mine in Inyo County. Most of the tungsten produced in 1995 came from concentrates purchased outside of the United States. Although no mining took place in 1995, some ore was processed from existing stockpiles. Avocet was planning to reopen the Pine Creek Mine during 1996. Other metallic minerals produced in the State included

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silver, iron, and mercury. California silver and mercury production resulted as a byproduct of the State's gold production, and all iron ore mined in the State in 1995 was used in the production of portland cement.

During the final days of the 1994-95 legislative session, SB 1108 was enacted granting remediating agencies limited liability for abandoned mine cleanup. Under provisions of the bill, if a public agency or a private entity in partnership with a public agency undergoes a remediation plan that successfully reduces the impact of water contamination, the agency or its affiliate cannot be held liable for any other preexisting contamination. The bill was expected to diminish any reluctance on the part of remediating agencies to confront mine cleanup due to possible legal consequences.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

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TABLE 2

CALIFORNIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	1,350	$10,800	$8.00
Filter stone	198	1,040	5.25
Other coarse aggregate	25	97	3.88
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,180	8,190	6.91
Bituminous aggregate, coarse	2,080	14,800	7.11
Bituminous surface-treatment aggregate	204	2,570	12.60
Railroad ballast	1,070	6,980	6.53
Other graded coarse aggregate	160	1,140	7.09
Fine aggregate (-3/8 inch):			
Stone sand, concrete	520	3,290	6.33
Stone sand, bituminous mix or seal	635	3,700	5.82
Screening, undesignated	491	1,820	3.71
Other fine aggregate	W	W	5.72
Coarse and fine aggregates:			
Graded road base or subbase	5,600	28,300	5.05
Unpaved road surfacing	237	1,070	4.50
Terrazzo and exposed aggregate	193	1,780	9.24
Crusher run or fill or waste	2,490	6,800	2.73
Other coarse and fine aggregates	417	1,670	4.01
Roofing granules	363	6,010	16.50
Other construction materials[3]	1,260	8,100	6.42
Agricultural: Poultry grit and mineral food[4]	99	1,780	18.00
Chemical and metallurgical: Cement manufacture[5]	12,900	45,900	3.56
Special:			
Asphalt filler or extenders	(6)	(6)	14.30
Whiting or whiting substitute	(6)	(6)	33.60
Other fillers or extenders	(6)	(6)	4.60
Other specified uses not listed[7]	1,560	47,400	30.30
Unspecified:[8]			
Actual	1,770	11,000	6.23
Estimated	6,280	44,100	7.02
Total	41,100	258,000	6.29

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes dolomite, granite, limestone, miscellaneous stone, quartzite, sandstone, shell, slate traprock, and volcanic cinder and scoria.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes pipe bedding.

[4]Includes agricultural limestone and other agricultural uses.

[5]Includes lime manufacture and sulfur oxide removal.

[6]Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[7]Includes flour (slate).

[8]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

CALIFORNIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r36	r18,000	r$120,000	$6.64	35	23,300	$149,000	$6.37
Dolomite	r5	r173	r1,540	8.91	4	208	1,550	7.47
Marble	r1	r451	r2,490	5.51	—	—	—	—
Shell	2	W	W	6.96	1	W	W	7.71
Granite	112	6,700	43,700	6.53	53	4,880	23,400	4.79
Traprock	r40	7,570	54,200	7.16	21	6,090	43,500	7.15
Sandstone	r9	r1,180	r5,110	r4.35	4	521	2,850	5.47
Quartzite	2	W	W	8.00	4	602	3,460	5.75
Slate	3	299	2,380	7.95	2	W	W	8.89
Volcanic cinder and scoria	38	356	1,760	4.95	47	487	2,100	4.31
Miscellaneous stone	r52	r3,870	r20,000	5.18	78	4,750	31,000	6.51
Total	XX	38,700	252,000	r6.51	XX	41,100	258,000	6.29

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

TABLE 4

CALIFORNIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 3		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	125	517	W	W	128	1,180	W	W
Coarse aggregate, graded[5]	—	—	447	4,350	336	2,250	805	8,320
Fine aggregate (-3/8 inch)[6]	15	W	W	W	135	772	W	W
Coarse and fine aggregate[7]	W	W	1,380	8,050	1,030	6,240	1,920	8,560
Other construction materials[8]	850	4,120	534	4,560	315	2,480	574	4,170
Agricultural[9]	(10)	(10)	—	—	—	—	(4)	(4)
Chemical and metallurgical[11]	(10)	(10)	—	—	—	—	—	—
Special[12]	—	—	—	—	(4)	(4)	(4)	(4)
Other miscellaneous uses	683	4,190	77	709	(4)	(4)	—	—
Unspecified:[14]								
Actual	70	141	25	77	22	242	1	2
Estimated	36	218	107	709	324	1,800	—	—
Total	1,780	9,200	2,570	18,500	2,300	15,600	3,330	21,300

See footnotes at end of table.

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TABLE 4—Continued

CALIFORNIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

	District 7		District 8		District 9		District 10	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	44	563	([4])	([4])	W	W	([4])	([4])
Coarse aggregate, graded[5]	W	W	—	—	W	W	—	—
Fine aggregate (-3/8 inch)[6]	W	W	—	—	228	W	([4])	([4])
Coarse and fine aggregate[7]	1,930	8,610	([4])	([4])	W	W	([4])	([4])
Other construction materials[8]	3,140	18,400	—	—	1,550	14,600	—	—
Agricultural[9]	([4])	([4])	—	—	([10])	([10])	([10])	([10])
Chemical and metallurgical[11]	([4])	([4])	3,400	12,600	5,830	17,400	([10])	([10])
Special[12]	—	—	—	—	([10])	([10])	([10])	([10])
Other miscellaneous uses	11	94	([13])	([13])	1,470	46,900	75	931
Unspecified:[14]								
Actual	87	230	—	—	25	42	—	—
Estimated	284	1,700	3,240	18,800	1,870	18,300	95	629
Total	8,440	40,900	6,670	31,500	11,000	97,200	221	1,920

	District 11		District 12	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	107	589	W	W
Coarse aggregate, graded[5]	429	2,050	—	—
Fine aggregate (-3/8 inch)[6]	([4])	([4])	—	—
Coarse and fine aggregate[7]	([4])	([4])	W	W
Other construction materials[8]	—	—	648	4,000
Agricultural[9]	—	—	—	—
Chemical and metallurgical[11]	—	—	—	—
Special[12]	—	—	—	—
Other miscellaneous uses	([4])	([4])	—	—
Unspecified:[14]				
Actual	1,540	10,300	—	—
Estimated	—	—	324	1,940
Total	3,800	16,300	971	5,940

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Production reported in District 1 was included with "District 2" and District 4 was included with "District 5" to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.

[4]Withheld to avoid disclosing company proprietary data; included with "Total."

[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[8]Includes pipe bedding and roofing granules.

[9]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

[10]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

[11]Includes cement manufacture, lime manufacture, and sulfur oxide removal.

[12]Includes asphalt fillers or extenders, other fillers or extenders, and whiting or whiting substitute.

[13]Less than 1/2 unit.

[14]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994 BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	28,300	$170,000	$5.99
Plaster and gunite sands	1,980	13,000	6.57
Concrete products (blocks, bricks, pipe, decorative, etc.)	1,030	6,890	6.71
Asphaltic concrete aggregates and other bituminous mixtures	11,800	77,300	6.55
Road base and coverings[2]	12,900	60,400	4.70
Fill	3,700	14,400	3.90
Railroad ballast	220	1,320	5.99
Filtration	447	3,310	7.41
Other[3]	452	3,290	7.28
Unspecified:[4]			
Actual	25,500	117,000	4.59
Estimated	10,000	56,400	5.62
Total or average	96,300	523,000	5.43

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement), snow and ice control.
[3]Includes roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	465	3,620	529	2,560	892	7,940
Asphaltic concrete aggregates and road base materials[3]	1,320	11,500	1,390	9,120	618	4,400
Other miscellaneous uses[4]	28	177	3	28	14	48
Unspecified:[5]						
Actual	29	147	13	23	(6)	8
Estimated	217	1,800	135	680	—	—
Total	2,060	17,300	2,070	12,400	1,520	12,400
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	5,200	33,400	775	5,410	2,990	21,400
Asphaltic concrete aggregates and road base materials[3]	7,150	45,800	1,280	7,670	2,880	16,300
Other miscellaneous uses[4]	43	199	217	1,430	479	3,480
Unspecified:[5]						
Actual	41	210	117	857	2,360	4,740
Estimated	2,050	12,900	1,300	6,080	1,230	7,140
Total	14,500	92,400	3,680	21,400	9,930	53,000

See footnotes at end of table.

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TABLE 6—Continued

CALIFORNIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

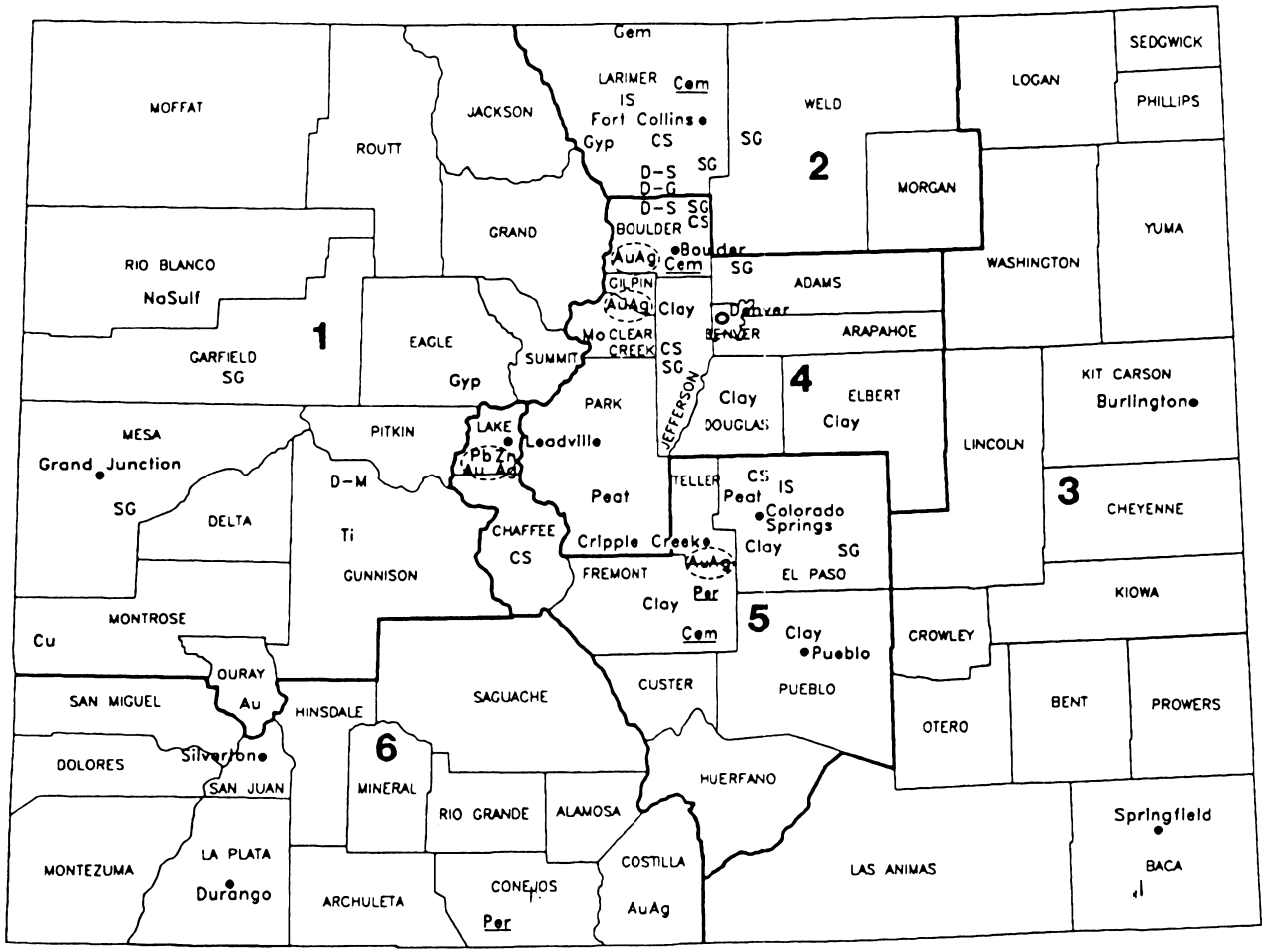
	District 7		District 8		District 9	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,620	12,300	3,640	19,000	6,310	30,100
Asphaltic concrete aggregates and road base materials[3]	780	2,600	3,400	16,300	5,230	18,700
Other miscellaneous uses[4]	132	1,120	64	555	18	71
Unspecified:[5]						
Actual	—	—	2,190	11,500	4,450	19,800
Estimated	341	2,250	825	4,430	589	3,390
Total	2,870	18,200	10,100	51,700	16,600	72,000
	District 10		District 11		District 12	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	480	1,760	6,900	41,600	1,550	10,800
Asphaltic concrete aggregates and road base materials[3]	137	366	2,740	14,100	1,430	5,380
Other miscellaneous uses[4]	3	7	22	169	96	629
Unspecified:[5]						
Actual	23	37	12,700	59,200	3,540	20,600
Estimated	465	2,510	553	2,700	2,340	12,500
Total	1,110	4,680	22,900	118,000	8,960	49,800

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, road and other stabilization (cement).
[4]Includes filtration, railroad ballast, and roofing granules.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[6]Less than 1/2 unit.

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COLORADO



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

AuAg	Gold-Silver
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
Cu	Copper
D-G	Dimension Granite
D-M	Dimension Marble
D-S	Dimension Sandstone
Gem	Gemstones
Gyp	Gypsum
IS	Industrial Sand
Mo	Molybdenum
NaSulf	Sodium Sulfate
Pb	Lead
Peat	Peat
Per	Perlite plant
SG	Sand and Gravel
Ti	Titanium
Zn	Zinc

Concentration of mineral operations

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF COLORADO

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Colorado Geological Survey for collecting information on all nonfuel minerals.

Colorado ranked 28th among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State was 29th in 1994 (based on final data). The estimated value for 1995 was $448 million, a nearly 10% increase from that of 1994. This followed a 2.7% increase from 1993 to 1994. The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

Almost three-fifths of Colorado's nonfuel mineral production value came from industrial minerals, especially construction sand and gravel, portland cement, and crushed stone. Most of the remaining value resulted from molybdenum, gold, and zinc, in descending order of value. An increase in molybdenum value of almost 80% accounted for much of the State's rise in value in 1995. Other nonfuel mineral values that increased in 1995 were zinc, lead, silver, Grade-A helium, and gemstones. The remaining mineral commodities (see table 1) decreased in value. In 1994, most of Colorado's mineral commodities increased in value, led by the gains in molybdenum and gold. Only construction sand and gravel and crushed and dimension stones decreased.

Compared with USGS estimates of the quantities produced in 1995 in the other 49 States, Colorado remained second in molybdenum, fifth in lead, sixth in zinc, and eighth in gold. Substantial quantities of construction sand and gravel, crushed stone, and portland cement were also produced in the State.

The Colorado Geological Survey[2] (CGS) reported that Pikes Peak Mining Co. opened the Cresson Mine in the Cripple Creek District of Teller County in February 1995. The new open pit mine reportedly has total proven and probable gold reserves of more than 66 million metric tons[3] (73 million short tons) at a grade of 1.03-grams-per-ton (0.03-troy-ounce-per-short-ton). Mine management had forecasted approximately 3,100 kilograms (100,000 troy ounces) of production for 1995 and about 5,100 kilograms (165,000 troy ounces) during 1996 and succeeding years. Pikes Peak also reported that it had depleted minable gold and silver reserves at its Globe Hill and Ironclad Mines. Both mines are closed and undergoing

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN COLORADO[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	281	$2,160	291	$2,320	288	$2,020
Gemstones		NA	258	NA	267	NA	300
Gold[3]	kilograms	W	W	[4]4,420	[4]54,700	[4]4,340	[4]52,000
Sand and gravel (construction)	thousand metric tons	[e]29,000	[e]118,000	29,000	109,000	27,500	106,000
Stone:							
Crushed	do.	10,300	62,000	8,600	53,600	8,200	51,300
Dimension	metric tons	4,320	1,370	[5]3,630	[5]51	W	W
Combined value of cement, copper (1993), gypsum (crude), helium (Grade-A), lead, lime, molybdenum, peat, perlite (1993), sand and gravel (industrial), silver, stone [dimension marble (1994)], zinc, and value value indicated by symbol W		XX	216,000	XX	[r]191,000	XX	237,000
Total		XX	399,000	XX	[r]410,000	XX	448,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Placer canvassing discontinued beginning 1994. May include placer data from other sources.

[5]Excludes certain stones; kind and value included with "Combined value" data.

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reclamation. Battle Mountain Gold Co., operator of the San Luis Gold Mine in Costilla County, reduced cash operating costs from $250 per troy ounce in the first quarter of 1995 to $210 in the second quarter. The company planned to produce about 2,100 kilograms (68,000 troy ounces) of gold per year in both 1995 and 1996.

During 1994, improving economies in the Far East and Europe resulted in an increase in the demand for molybdenum, leading to higher prices in early 1995. In January 1995, the free market price for molybdic acid rose from $35 to almost $40 per kilogram ($16 to $18 per pound), gradually declining to $9.40 to $10.35 per kilogram ($4.25 to $4.70 per pound) by late September. As a result of the January molybdenum price increase, Cyprus Amax Minerals Co. increased production at the Henderson Mine, Clear Creek County, and reopened the Climax Mine in Lake County from April to August. Production for 1995 from both mines was estimated at more than 18,000 tons (40 million pounds). Providing that the global economy continues to improve, company officials predicted that 1996 production would stabilize at slightly below that level. Base metal production, excluding molybdenum, was relatively insignificant in the State. However, ASARCO Incorporated announced it would continue production of more than 800 tons per day (900 short tons per day) of copper-lead-zinc-silver-gold ore from its Black Cloud Mine at Leadville, Lake County.

Diamond Company N.L. of Fort Collins completed a 160 metric-ton-per-hour diamond processing plant at its Kelsey Lake property in the State Line District of Larimer County in December 1995. More than 60% of the diamonds recovered during a bulk sampling program in 1994 were of gem quality, including a 14.2 carat white diamond, the largest ever discovered in the district and the eighth largest found in North America. Mining of two kimberlite bodies during 1995 was expected to provide a stockpile for the proposed plant startup in the first half of 1996. The company reported initial diamond-bearing kimberlite reserves of 16.9 million tons down to 100 meters depth.

The construction sand and gravel and aggregate industries reportedly were doing well in the Front Range area from Colorado Springs to Fort Collins and in selected areas of western Colorado. CGS expected production of aggregate in 1995 to be about 41 million tons (45 million short tons), down slightly from 1994 levels.

High-quality, low-sulfur coal from Colorado was in moderately high demand. Production in 1995 was estimated at almost 23 million tons (25 million short tons). In 1995, while several of the State's coal mines were idled or shut down, other mines such as Cyprus Amax's Twentymile Mine were setting new production records. The coal mines surviving in Colorado were efficient, low-cost producers.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the Colorado Geological Survey.

[3]All tons are metric tons unless otherwise specified.

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TABLE 2

COLORADO: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch)			
Riprap and jetty stone	364	$2,350	$6.46
Filter stone	W	W	4.24
Other coarse aggregate	7	32	16.50
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	6.67
Bituminous aggregate, coarse	671	4,470	6.65
Railroad ballast	13	62	4.77
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	3.40
Screening, undesignated	77	1,270	16.50
Coarse and fine aggregates:			
Graded road base or subbase	564	2,680	4.75
Terrazzo and exposed aggregate	W	W	14.40
Crusher run or fill or waste	476	1,410	2.96
Other coarse and fine aggregates	1,340	7,340	5.49
Poultry grit and mineral food	(3)	(3)	6.61
Chemical and metallurgical:			
Cement manufacture	1,320	6,770	5.12
Special:			
Mine dusting or acid water treatment	(3)	(3)	6.61
Asphalt fillers or extenders	(3)	(3)	6.61
Unspecified:[4]			
Actual	3,110	23,100	7.42
Estimated	531	3,320	6.26
Total	8,600	53,600	6.23

W Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."
[1]Includes granite, limestone, miscellaneous stone, sandstone, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

COLORADO: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r 211	r 2,750	r $14,900	r $5.44	8	2,550	$13,900	$5.46
Granite	8	3,430	16,900	4.93	5	3,180	16,500	5.17
Sandstone	r13	r3,290	r27,200	r8.25	9	2,500	21,500	8.59
Volcanic cinder	2	W	W	5.44	1	W	W	7.21
Miscellaneous stone	11	W	W	3.29	11	W	W	4.51
Total	XX	10,300	62,000	5.99	XX	8,600	53,600	6.23

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.

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TABLE 4

COLORADO: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	W	W	W	W	30	212	(4)	(4)
Coarse aggregate, graded[5]	—	—	W	W	W	W	—	—
Fine aggregate (-3/8 inch)[6]	W	W	W	W	W	W	—	—
Coarse and fine aggregate[7]	298	2,700	2,690	13,600	478	3,050	—	—
Agricultural[8]	(4)	(4)	—	—	—	—	—	—
Chemical and metallurgical[9]	(4)	(4)	(4)	(4)	—	—	—	—
Special[10]	(4)	(4)	—	—	—	—	—	—
Unspecified:[11]								
Actual	(4)	(4)	(4)	(4)	845	4,730	(4)	(4)
Estimated	(4)	(4)	110	672	421	2,650	—	—
Total	1,130	6,790	5,650	35,900	1,770	10,600	46	280

W Withheld to avoid disclosing company proprietary data; included with "Coarse and fine aggregate."

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data; no crushed stone was produced in District 3.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.

[4]Withheld to avoid disclosing company proprietary data; included in "Total."

[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), and railroad ballast.

[6]Includes stone sand (bituminous mix or seal) and screening (undesignated).

[7]Includes graded road base or subbase, terrazzo and exposed aggregate, crusher run (select material or fill), and other coarse and fine aggregates.

[8]Includes poultry grit and mineral food.

[9]Includes cement manufacture.

[10]Includes asphalt fillers or extenders and mine dusting or acid water treatment.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,700	$22,600	$4.81
Plaster and gunite sands	59	437	7.41
Concrete products (blocks, brick, pipe, decorative, etc.)	180	1,380	7.68
Asphaltic concrete aggregates and other bituminous mixtures	1,700	7,010	4.13
Road base and coverings[2]	6,240	20,800	3.33
Fill	1,390	3,180	2.29
Snow and ice control	158	875	5.54
Other[3]	563	1,820	3.24
Unspecified:[4]			
Actual	8,120	27,300	3.36
Estimated	5,910	23,100	3.91
Total or average	29,000	109,000	3.74

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes road and other stabilization (cement and lime).

[3]Includes railroad ballast.

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

COLORADO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	422	2,510	1,220	5,200	106	613
Asphaltic/bituminous mixtures	286	1,790	377	1,530	W	W
Road base and coverings[3]	2,490	9,300	1,060	3,030	366	819
Fill	359	916	124	344	W	W
Other miscellaneous uses[4]	11	37	11	55	235	747
Unspecified:[5]						
Actual	618	2,610	3,510	10,500	127	210
Estimated	1,450	4,820	970	3,680	172	320
Total	5,640	22,000	7,270	24,400	1,010	2,710
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	2,020	10,500	1,080	4,900	97	714
Asphaltic/bituminous mixtures	280	815	465	2,040	W	W
Road base and coverings[3]	563	1,690	682	1,880	1,080	4,070
Fill	485	1,200	371	579	W	W
Other miscellaneous uses[4]	572	1,980	105	567	127	301
Unspecified:[5]						
Actual	3,670	13,100	189	783	—	—
Estimated	1,430	6,180	812	3,300	1,080	4,840
Total	9,020	35,500	3,700	14,000	2,380	9,920

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes plaster and gunite sands.

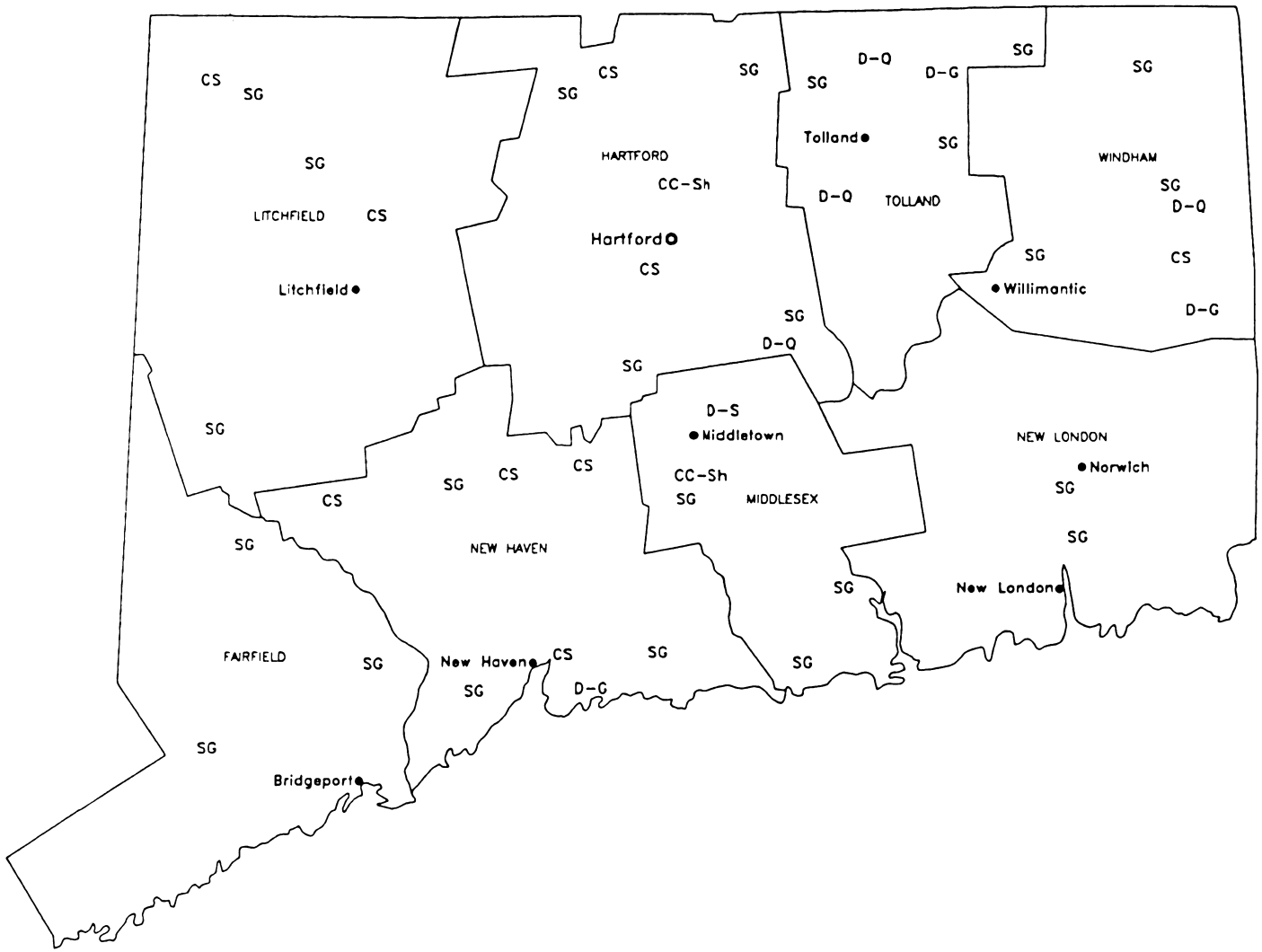
[3]Includes road and other stabilization (cement and lime).

[4]Includes railroad ballast and snow and ice control.

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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CONNECTICUT



LEGEND

- State boundary
- County boundary
- Capital
- City

MINERAL SYMBOLS

CC-Sh	Common Clay & Shale
CS	Crushed Stone
D-G	Dimension Granite
D-Q	Dimension Quartzite
D-S	Dimension Sandstone
SG	Sand and Gravel

0 20 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF CONNECTICUT

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the State Geological and Natural History Survey of Connecticut, Department of Environmental Protection, for collecting information on all nonfuel minerals.

In 1995, for the 4th consecutive year, Connecticut was 44th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $81 million, a 1% decrease from that of 1994. This followed a nearly 10% decrease from 1993 to 1994. The State accounted for somewhat less than 0.5% of the U.S. total.

Crushed stone and construction sand and gravel, the leading mineral commodities by value, accounted for nearly all of the State's nonfuel mineral production and value. Dimension stone, common clays, and gemstones were also produced in the State. Connecticut's total nonfuel mineral production value in 1995, as represented in table 1, is artificially low because data have been withheld to avoid disclosing company proprietary data. Connecticut's ranking was not affected by the withholding of data. Compared with 1994, the value of crushed stone increased. Nonfuel mineral values that decreased were construction sand and gravel, dimension stone, and common clays. No industrial sand and gravel production was reported to the USGS for 1995.

According to the Connecticut Geological and Natural History Survey, a bill allowing towns to protect traprock ridges within their borders from development, including quarrying, was passed by the State Legislature and became effective October 1. The Connecticut Construction Industry Association was able to have the bill amended to permit quarrying operations that were approved before the effective date to continue.

Additionally, the towns of Middletown, Meriden, and Berlin jointly developed a land use plan for Lamentation Mountain that would protect habitats, vistas, and traprock at the highest elevations. The York Hill Trap Rock Quarry, Inc., probably would not be allowed to expand its quarry on the southern end of the mountain, if the plan were adopted by the towns' respective planning and zoning commissions.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data in this publication are estimates, as of Dec. 1995. Construction sand and gravel and crushed stone estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN CONNECTICUT[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$5	NA	$5	NA	$5
Sand and gravel (construction)	thousand metric tons	[e]6,400	[e]34,900	5,420	28,000	5,300	27,800
Stone (crushed)	do.	[3]4,600	[3]39,500	5,710	51,000	5,900	53,100
Combined value of other industrial minerals		XX	16,200	XX	2,670	XX	(4)
Total		XX	90,700	XX	81,800	XX	[5]80,900

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; kind and value included with "Combined value" data.

[4]Value excluded to avoid disclosing company proprietary data.

[5]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

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TABLE 2
CONNECTICUT: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch)			
Riprap and jetty stone	76	$499	$6.57
Filter stone	7	82	11.70
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	5.51
Bituminous aggregate, coarse	W	W	5.51
Fine aggregate (-3/8 inch):			
Stone sand, concrete	27	45	1.67
Screening, undesignated	193	2,370	12.30
Coarse and fine aggregates:			
Graded road base or subbase	170	1,110	6.55
Crusher run or fill or waste	W	W	11.00
Other coarse and fine aggregates	316	1,880	5.93
Agricultural: Agricultural limestone	29	352	12.10
Special:			
Asphalt fillers or extenders	73	1,200	16.40
Other fillers or extenders	154	3,700	24.00
Other specified uses not listed	4	92	23.00
Unspecified:[3]			
Actual	2,500	21,600	8.62
Estimated	2,160	18,100	8.39
Total	5,710	51,000	8.93

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Includes dolomite, granite, limestone, and traprock.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
CONNECTICUT: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	6	1,150	$9,400	$8.14	5	1,440	W	W
Dolomite	(2)	(2)	(2)	(2)	1	408	W	W
Granite	3	129	1,490	11.50	3	119	$1,350	$11.30
Traprock	8	3,320	28,600	8.63	8	3,750	30,100	8.04
Miscellaneous stone	(2)	(2)	(2)	(2)	—	—	—	—
Total	XX	4,600	39,500	8.59	XX	5,710	51,000	8.93

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes dolomite and miscellaneous stone from State total to avoid disclosing company proprietary data.

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TABLE 4

CONNECTICUT: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	496	$2,960	$5.96
Plaster and gunite sands	W	W	5.63
Concrete products (blocks, brick, pipe, decorative, etc.)	47	286	6.09
Asphaltic concrete aggregates and other bituminous mixtures	542	1,990	3.67
Road base and coverings	625	2,970	4.75
Fill	612	2,380	3.89
Snow and ice control	313	1,530	4.90
Filtration	54	414	7.67
Other	123	522	4.24
Unspecified:[2]			
Actual	1,070	3,450	3.22
Estimated	1,530	11,500	7.53
Total or average	5,420	28,000	5.18

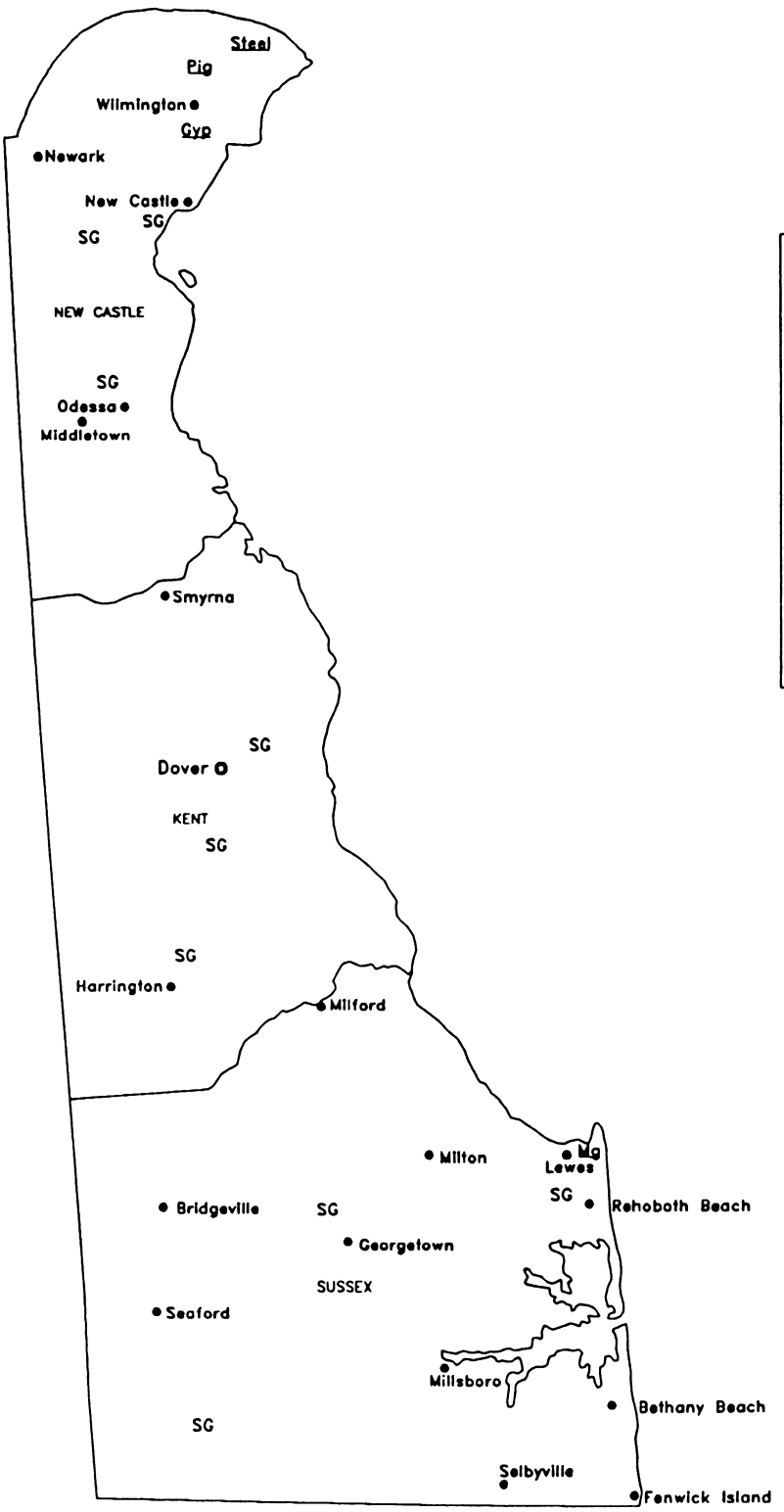
W Withheld to avoid disclosing company proprietary data; included in "Other."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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DELAWARE



LEGEND

State boundary

County boundary

Capital

City

MINERAL SYMBOLS

Gyp Gypsum plant

Mg Magnesium metal plant

Pig Titanium Dioxide pigments

SG Sand and Gravel

Steel Iron and Steel plant

0 10 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF DELAWARE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Delaware Geological Survey for collecting information on all nonfuel minerals.

Delaware remained 50th in the Nation in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). Construction sand and gravel and gemstones were mined in the State. Additionally, Delaware ranked fifth of the 6 States that produce magnesium compounds in the United States. Magnesium compounds were extracted from seawater close to the mouth of the Delaware Bay, near Lewes, Sussex County, for use in the manufacture of chemical and pharmaceutical products. Additionally, raw steel was produced in the State but was processed from materials acquired from other domestic and foreign sources.

The Delaware Geological Survey[2] (DGS) remained, by State law, the official State contact with all agencies of the U.S. Department of the Interior (DOI). DGS reported that Delaware was the first State to have completely revised, modern topographic maps. Newly completed 1:24,000 quadrangle topographic maps (paper copies) became available in 1993. The DGS and the USGS completed the digital version of the maps, including overlays of the differing types of contained information, in 1994 and is electronically available on CD-ROM from DGS. The Minerals Management Service (DOI) continued to provide funding for studies characterizing offshore sand resources to be used in beach replenishment.

Based on DGS estimates, the agency thinks that the amount of sand and gravel produced from Delaware's natural resources is higher than previously reported by the U.S. Bureau of Mines and currently by the USGS. During the past 10 years, the publicly reported production has ranged from 1.4 to 2.7 million metric tons (1.5 to 3.0 million short tons). The USGS estimate for 1995, based on the companies participating in the USGS canvass surveys, is about 2.6 million metric tons. The DGS thinks Delaware's actual mined production of construction sand and gravel to be significantly higher, though not officially reported as such. One reason for this difference is that agencies, such as the Delaware Department of Transportation, or companies that produce from pits for their own use do not necessarily report production the same as companies that sell products. In addition to mined minerals and materials, the DGS includes byproduct gypsum and sulfur from the State's oil and gas refinery production as part of its annual total nonfuel mineral-related activity. The DGS estimates Delaware's total nonfuel mineral-related activity annually to be approximately $30 million.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Construction sand and gravel estimates are updated periodically. To obtain the most current information, please contact the USGS construction sand and gravel commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the Delaware Geological Survey.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN DELAWARE[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$1	NA	$1	NA	$1
Sand and gravel (construction)	thousand metric tons	[e]2,500	[e]10,300	2,580	8,680	2,600	8,900
Total[3]		XX	10,300	XX	8,680	XX	8,900

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

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TABLE 2

DELAWARE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	1,240	$5,210	$4.21
Road base and coverings[3]	1,180	2,540	2.15
Unspecified:[4] Actual	158	940	5.95
Total or average	2,580	8,680	3.37

[1]Data rounded to three significant digits; may not add to totals shown.

[2]Includes plaster and gunite sands.

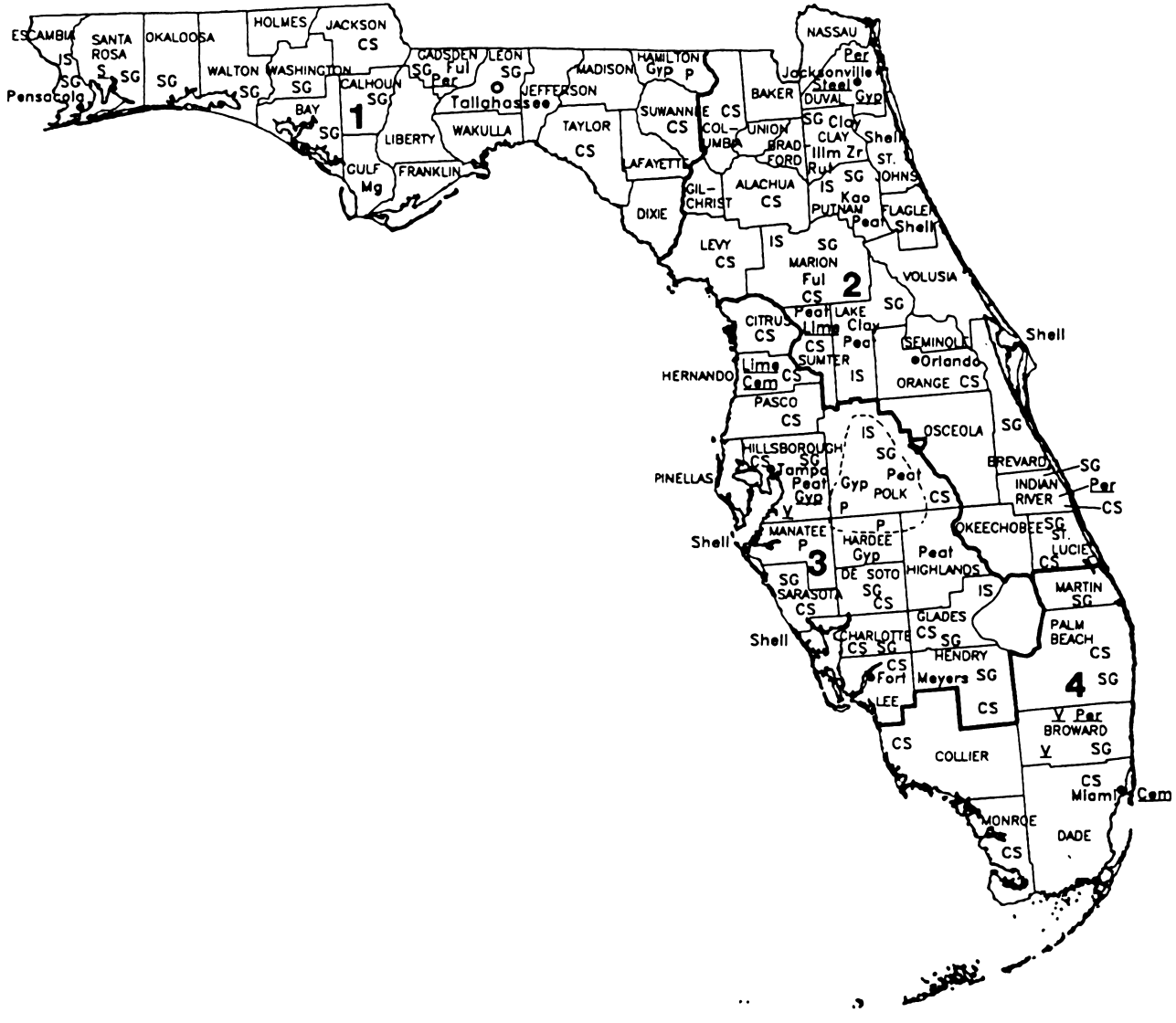
[3]Includes fill and snow and ice control.

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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FLORIDA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Cem	Cement plant
Clay	Common Clay
CS	Crushed Stone
Ful	Fuller's earth
Gyp	By Product Gypsum
Gyp	Gypsum plant
Ilm	Ilmenite
Kao	Kaolin
Lime	Lime plant
Mg	Magnesium
P	Phosphate rock
Peat	Peat
Per	Perlite Plant
Rut	Rutile
SG	Sand and Gravel
IS	Industrial Sand
Shell	Shell
Steel	Steel Plant
S	Sulfur Plant
V	Vermiculite Plant
Zr	Zircon

Concentration of mineral operations

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF FLORIDA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Florida Department of Mines and Mineral Resources for collecting information on all nonfuel minerals.

Florida ranked ninth among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). This is a decline from eighth place in 1994. The estimated value for 1995 was $1.4 billion, an increase of about 1% from that of 1994. This followed a 4.5% increase in 1994 from that of 1993 (based on final 1994 data). The State accounted for about 4% of the U.S. total nonfuel mineral production value.

Florida continued to be the Nation's leading phosphate rock-mining State in 1995, producing more than four times the quantity as the next-highest State. Phosphate rock is only produced in four States. The phosphate rock industry usually has the most impact on the State's raw nonfuel mineral economy. Other minerals that commonly have a significant effect on the State's overall nonfuel mineral production value are crushed stone, construction sand and gravel, and portland cement. In 1995, the increase in the State's mineral production value mainly resulted from a substantial increase in the value of phosphate rock. This increase was mitigated by decreases in portland cement, zircon concentrates, and titanium concentrates. The overall increase extended the rebound in Florida's mineral production value begun in 1994. Since reaching the State's second all-time high of $1.61 billion in 1989, the State's mineral value had been on a downward trend. This culminated in the 9% drop to $1.31 billion from 1992 to 1993; declining phosphate rock value was the principal contributor. Most other mineral commodities in 1993 increased. In 1994, the increased values of crushed stone, phosphate rock, and portland and masonry cements were principally responsible for the turnaround in mineral value.

Compared with 1994, the values of fuller's earth clays, staurolite, and peat increased in 1995. In addition to the more significant decreases mentioned above, other mineral commodoties had small to only slight decreases in 1995. These were: crushed stone, construction sand and gravel, masonry cement, magnesium compounds, industrial sand and gravel, and common and kaolin clays.

Florida, almost exclusively an industrial-mineral-producing State, remained first in phosphate rock and

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN FLORIDA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	351,000	$27,300	400,000	$34,600	393,000	$34,000
Portland	do.	4,190,000	211,000	3,370,000	228,000	2,970,000	200,000
Clays[3]	thousand metric tons	407	52,700	430	55,000	363	55,100
Peat	metric tons	219,000	3,780	206,000	3,230	W	W
Sand and gravel:							
Construction	thousand metric tons	[e]22,800	[e]73,100	16,600	60,700	15,800	59,300
Industrial	metric tons	504,000	5,910	540,000	6,120	591,000	6,050
Stone (crushed)	thousand metric tons	64,900	313,000	[e]67,000	343,000	66,500	343,000
Combined value of clays (common), gemstones, magnesium compounds, phosphate rock, rare-earth metal concentrates (1993-94), staurolite, stone [crushed dolomite and limestone (1993)], titanium concentrates (ilmenite and rutile), zircon concentrates, and value indicated by symbol W		XX	624,000	XX	639,000	XX	689,000
Total		XX	1,310,000	XX	1,370,000	XX	1,390,000

[e]Estimated. [p]Preliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combine value" data. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.
[4]Excludes certain stones; kind and value included with "Combined value" data.

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first of two States with ilmenite (a titanium ore) production, fourth in crushed stone, and seventh in portland cement. (All rankings are based on 1995 USGS-estimated data).[1] Additionally, Florida was the only State to produce zircon concentrates, staurolite, and rutile concentrates (a titanium ore). While climbing from second to first in the production of masonry cement, the State dropped from first to second in peat production; second to third in magnesium compounds; and third to fourth in fuller's earth. Although not placing among the top 10 producing States, Florida mines produced significant quantities of construction and industrial sand and gravel.

The remainder of this narrative was derived from information provided by the Florida Geological Survey. In 1995 Florida State Legislature, passed a new law entitled the "Life-of-the-Mine Permit." This bill, which designates the Florida Bureau of Mine Reclamation (BOMR) as the regulatory authority, was intended to ease the overall permitting process for operators producing fuller's earth and heavy minerals. The new law allows the operator to combine several different permits and plans into one environmental permit. Included in the Life-of-the-Mine Permit are dredge and fill permits, the mine's reclamation plan, and management and storage of surface water permits. BOMR was made responsible for initiating and coordinating a concurrent review of two portions of the Life-of-the-Mine Permit: the industrial waste water and the national pollution discharge elimination system permits. Previously, these permits were handled by various agencies, including the former Florida Department of Environmental Regulation, the Florida Department of Natural Resources, and the State's Water Management District Offices. The U.S. Army Corps of Engineers will continue processing Federal dredge and fill permits.

Rising phosphate rock production led to increased employment and profitability for companies. Although most of the phosphate rock produced during the year was sold domestically, exports of phosphate fertilizers continued to play an important role in the industry's vitality. The largest consuming nations of Florida phosphate were China, India, and the countries of eastern Europe and the former Soviet Union. The companies that were engaged in phosphate mining in the State in 1995 included: Cargill Fertilizer Inc., CF Industries Inc., IMC-Agrico Co., Mobil Mining and Minerals Co., and White Springs Agricultural Chemicals, Inc. (formerly Occidental Chemical Corp.). Of these, IMC-Agrico brought the Clear Springs Mine back on line in 1994. CF Industries opened its South asture Mine during the 4th quarter. Mobil Mining recently sold its South Fort Meade Mine to Cargill Fertilizer.

The new voice of the Florida aggregate industry is the Florida Limerock and Aggregate Institute (FLAI). The institute is an autonomous division of the Florida Concrete Products Association, with which it recently merged. The primary focus of the FLAI is the pursuit of promotional, technical, and regulatory matters of concern to the aggregate industry. The Florida aggregate industry is working closely with the Florida Department of Transportation to improve the effectiveness of the quality assurance program used to control aggregate quality. In other activities within the Florida aggregate industry, Martin Marietta Aggregates purchased the Florida production and redistribution terminal operations formerly owned by Dravo Basic Materials Co.

RGC (USA) Mineral Sands, Inc., ceased extraction of monazite from the heavy mineral sands concentrate at its Clay County facility. However, heavy mineral mining continued from dredging operations on leased lands in Clay and Putnam Counties, while extraction of ilmenite, rutile, and zircon concentrate was done in Clay County. E. I. du Pont de Nemours & Co. Inc. continued mining the entire Trail Ridge area in Clay and Baker Counties, especially for rutile and ilmenite. These titanium-bearing heavy minerals are a primary ingredient in the manufacture of titanium dioxide pigments.

Although production of specialty grades of clay were increasing, the overall clay business continued to decline during 1995. The majority of this decline was in the absorbent products market sector and appeared to be a result of environmental pressures being placed on petroleum cleanup operations regarding the disposal of contaminated clay.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

FLORIDA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	50	$296	$5.92
Filter stone	220	1,610	7.30
Other coarse aggregate	W	W	16.50
Coarse aggregate, graded:			
Concrete aggregate, coarse	12,300	85,100	6.92
Bituminous aggregate, coarse	4,410	26,800	6.09
Bituminous surface-treatment aggregate	760	4,220	5.56
Railroad ballast	137	226	1.65
Other graded coarse aggregate	W	W	5.63
Fine aggregate (-3/8 inch):			
Stone sand, concrete	3,930	24,200	6.15
Stone sand, bituminous mix or seal	1,990	10,700	5.40
Screening, undesignated	3,770	20,900	5.55
Other fine aggregates	W	W	4.65
Coarse and fine aggregates:			
Graded road base or subbase	15,800	61,000	3.85
Unpaved road surfacing	355	1,470	4.15
Crusher run or fill or waste	3,490	8,420	2.41
Other coarse and fine aggregates	2,640	12,900	4.88
Other construction materials	1,340	7,280	5.42
Agricultural:			
Agricultural limestone	563	6,330	11.20
Other agricultural uses[3]	392	2,220	5.67
Special:			
Asphalt fillers or extenders	86	648	7.53
Other fillers or extenders	1	4	4.00
Other specified uses not listed[4]	1,920	2,890	1.51
Unspecified:[5]			
Actual	8,160	39,500	4.84
Estimated	4,600	26,700	5.80
Total	67,000	343,000	5.13

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes calcareous marl, dolomite, limestone, limestone-dolomite, and shell.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes poultry grit and mineral food.
[4]Includes cement manufacture.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
FLORIDA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	85	62,500	[3]$301,000	[3]$4.81	82	64,200	$330,000	$5.14
Shell	8	1,130	4,240	3.76	6	1,160	4,530	3.92
Dolomite	3	W	5,020	W	3	W	W	5.84
Calcareous marl	1	W	r3,190	W	1	W	W	5.09
Total	XX	64,900	313,000	4.83	XX	67,000	343,000	5.13

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.
[3]Excludes limestone-dolomite value from State total to avoid disclosing company proprietary data.

TABLE 4
FLORIDA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	—	—	(3)	(3)	17	76	(3)	(3)
Coarse aggregate, graded[4]	(3)	(3)	(3)	(3)	6,810	50,900	10,600	63,000
Fine aggregate (-3/8 inch)[5]	(3)	(3)	(3)	(3)	3,520	19,400	6,770	39,200
Coarse and fine aggregate[6]	(3)	(3)	(3)	(3)	3,860	12,900	11,700	47,400
Other construction materials	—	—	—	—	—	—	(3)	(3)
Agricultural[7]	(3)	(3)	(3)	(3)	781	7,500	—	—
Chemical and metallurgical[8]	—	—	—	—	W	W	—	—
Special[9]	—	—	—	—	W	W	—	—
Other miscellaneous uses	—	—	—	—	2,000	3,540	—	—
Unspecified:[10]								
Actual	513	1,440	830	5,230	85	694	6,740	32,200
Estimated	658	4,030	1,520	11,400	620	3,150	1,810	8,130
Total	2,420	11,600	8,920	42,300	17,700	98,100	37,900	191,000

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, riprap and jetty stone, and other coarse aggregate.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[8]Includes cement manufacture.
[9]Includes other specified uses not listed.
[10]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	6,790	$28,800	$4.25
Plaster and gunite sands	367	1,380	3.75
Concrete products (blocks, bricks, pipe, decorative, etc.)	515	2,320	4.50
Asphaltic concrete aggregates and other bituminous mixtures	547	3,560	6.50
Road base and coverings[2]	546	1,550	2.85
Fill	2,470	4,200	1.70
Other[3]	948	4,870	5.14
Unspecified:[4]			
Actual	883	3,170	3.59
Estimated	3,560	10,800	3.04
Total or average	16,600	60,700	3.65

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes filtration.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

FLORIDA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,250	5,660	4,950	20,900	1,480	6,000	—	—
Asphaltic concrete aggregates and road base materials[3]	505	2,850	498	1,240	1,530	3,080	1,030	2,140
Other miscellaneous uses[4]	16	42	148	994	664	3,300	121	531
Unspecified:[5]								
Actual	54	476	385	1,700	249	671	195	323
Estimated	1,130	3,630	1,450	4,190	848	2,620	136	400
Total	2,950	12,700	7,430	29,000	4,770	15,700	1,480	3,390

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill and road and other stabilization (lime).
[4]Includes filtration.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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GEORGIA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Au	Gold	DM	Dimension Marble	Mul	Synthetic Mullite
Ba	Barite	DQ	Dimension Quartzite	Per	Perlite plant
Baux	Bauxite	Fel	Feldspar	SG	Sand and Gravel
Cem	Cement plant	FePg	Iron Oxide pigments	IS	Industrial Sand
Clay	Clay	Ful	Fuller's earth	Steel	Iron and Steel plant
CS	Crushed Stone	Gyp	Gypsum plant	TI	Titanium plant
Cu	Copper smelter	Kao	Kaolin		Concentration of mineral operations
DG	Dimension Granite	Mica	Mica		

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF GEORGIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Georgia Geologic Survey, Environmental Protection Division, Georgia Department of Natural Resources, for collecting information on all nonfuel minerals.

Georgia ranked fifth nationally, for the second consecutive year, in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value was nearly $1.7 billion, about an 8% increase from that of 1994. This followed the more than 8% growth in 1994 (based on final 1994 data) compared with that of 1993. The State accounted for more than 4% of the U.S. total nonfuel mineral production value.

Kaolin clay remained Georgia's foremost nonfuel mineral commodity, accounting for about 62% of the State's estimated nonfuel mineral value. Kaolin production value, the largest portion of the State's increase in mineral value in 1995, was up nearly 8%. Crushed stone, which represents almost 23% of the State's nonfuel mineral value, also had a significant effect on overall output, rising 14% in value from 1994. Compared with 1994, the value of kaolin crushed stone, fuller's earth clays, dimension stone, construction sand and gravel, masonry cement, barite, industrial sand and gravel, and feldspar increased. Decreases occurred in portland cement, common clays, mica, and bauxite.

Based on USGS estimates of quantities of minerals produced in the United States during 1995, Georgia remained first among the 50 States in kaolin fuller's earth and dimension stone; second of only two bauxite-producing States; third in mica and iron oxide pigments; fourth in feldspar; and ninth in masonry cement. While the State rose from third to second in the production of barite and from ninth to fifth in crushed stone, it dropped from fifth to sixth in the production of common clays. Although not ranking among the top 10 States, Georgia manufacturing plants and mines produced significant quantities of portland cement and construction and industrial sand and gravel.

According to the Georgia Geologic Survey (GGS), the State's mining industry in 1995 experienced its second consecutive year of improved sales and profitability. Improved kaolin production resulted from growing strength in the paper industry, the primary customer of the kaolin industry, and because of the State's overall strong economy. Highway construction and institutional building increased significantly in 1995 in preparation for the 1996 Summer Olympics in Atlanta, providing increasing demand for crushed stone and construction sand and gravel. The Olympics were expected to have a

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN GEORGIA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	9,660	$994,000	9,960	$1,060,000	10,700	$1,130,000
Gemstones		NA	51	NA	51	NA	51
Sand and gravel:							
Construction	thousand metric tons	e4,600	e16,600	5,520	19,800	5,700	21,400
Industrial	metric tons	491,000	7,940	440,000	7,040	500,000	7,040
Stone:							
Crushed	thousand metric tons	49,400	292,000	54,600	331,000	61,000	381,000
Dimension[4]	metric tons	176,000	18,700	200,000	19,100	217,000	30,200
Combined value of barite, bauxite, cement, clays [fire (1993-94)], feldspar, iron oxide pigments (crude), mica (scrap), and stone [dimension marble (1993), dimension marble and miscellaneous (1994-95)]		XX	101,000	XX	116,000	XX	98,900
Total		XX	1,430,000	XX	r1,550,000	XX	1,670,000

eEstimated. pPreliminary. rRevised. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Excludes certain stones; kind and value included with "Combined value" data.

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continued effect on the consumption of construction materials as some non-Olympic construction postponed until 1997 resumes. Overall, Georgia's mining companies had modest expansions with new capital investments similar to those of 1994. The focus of capital investments during 1996 was projected to be on improved productivity and quality control.

The dimension granite industry in both 1994 and 1995 remained at consistent levels of production. The "Elberton Granite" remained the backbone of the industry; a growing market existed for this blue-gray granite, commonly used for road curbing in the Northeastern United States. This demand continued to help Georgia quarries by providing a large volume market for a grade of stone not usually suitable for monumental purposes. However, dimension stone prices overall remained suppressed due to competition among local producers and the growing volume of less expensive foreign products imported from Canada, China, and India. The volume of colored stone granite being finished by companies in Elberton, Elbert County, noticeably increased. These granites included black granites imported from Africa, and various domestic granites from Missouri, North Carolina, Oklahoma, Pennsylvania, and South Carolina.

Advancements in the development of automated quarrying machines continued, specifically air and oxygen burners. This equipment, developed by local machinists, was being sold throughout the United States. Although not specific to the State of Georgia alone, GGS reported that a coalition of U.S. stone producers, requesting modifications to the Harmonized Tariff, successfully petitioned the U.S. International Trade Commission to include specific classifications for imported finished monuments and markers.

Major challenges anticipated by Georgia's mining industry in 1996 involved environmental issues, under he general titles of Environmental Justice and Environmental Audits, as well as matters relating to Clean Air Legislation and Clean Water Act reauthorization. Under the environmental justice category, various studies were performed by State personnel and private consultants to address concerns and complaints made against some minerals operations and zoning boards. Some citizen's groups claimed that mining and industrial facilities were being preferentially sited in minority neighborhoods and that environmental regulations were not being uniformly enforced. Also at issue was the fairness and proper use of Environmental Audits regarding potential liabilities of proposed mineral operation projects. Financial institutions use this information as part of their loan approval process in order to best judge the true risk of a proposed project and, if approved, assign conditions to their investments. At the convening of the 1996 Georgia General Assembly, reintroduction of a severance tax bill that would affect the mining industry was also expected.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

GEORGIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch)			
Riprap and jetty stone	406	$3,670	$9.03
Filter stone	257	1,870	7.27
Other coarse aggregate	W	W	5.17
Coarse aggregate, graded:			
Concrete aggregate, coarse	6,130	37,000	6.04
Bituminous aggregate, coarse	7,470	46,300	6.20
Bituminous surface-treatment aggregate	12	78	6.50
Railroad ballast	W	W	5.23
Other graded coarse aggregate	W	W	6.68
Fine aggregate (-3/8 inch):			
Stone sand, concrete	1,980	11,800	5.98
Stone sand, bituminous mix or seal	1,170	5,950	5.09
Screening, undesignated	563	2,810	4.99
Other fine aggregate	41	338	8.24
Coarse and fine aggregates:			
Graded road base or subbase	2,950	14,200	4.81
Unpaved road surfacing	75	393	5.24
Terrazzo and exposed aggregate	W	W	5.74
Crusher run or fill or waste	5,470	29,500	5.39
Other coarse and fine aggregates	W	W	6.29
Other construction materials	3,490	20,100	5.77
Agricultural: Agricultural limestone	(3)	(3)	6.31
Chemical and metallurgical: Cement manufacture	(3)	(3)	4.92
Special: Other fillers or extenders	(3)	(3)	6.83
Unspecified:[4]			
Actual	23,200	150,000	6.43
Estimated	421	2,710	6.44
Total	54,600	331,000	6.07

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes calcareous marl, granite, limestone, limestone-dolomite, marble, and quartzite.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

GEORGIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r13	r5,270	r$32,000	r$6.08	11	5,090	$31,000	$6.09
Marble	7	W	W	7.20	8	W	W	7.29
Calcareous marl	1	W	W	4.00	1	W	W	4.20
Granite	52	41,600	245,000	5.90	48	47,200	287,000	6.08
Quartzite	3	357	2,100	5.89	3	340	2,100	6.18
Total	XX	49,400	292,000	5.92	XX	54,600	331,000	6.07

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.

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TABLE 4

GEORGIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	W	W	525	3,900	(3)	(3)
Coarse aggregate, graded[4]	W	W	11,000	67,100	(3)	(3)
Fine aggregate (-3/8 inch)[5]	W	W	2,650	14,000	(3)	(3)
Coarse and fine aggregate[6]	W	W	6,680	34,800	(3)	(3)
Other construction materials	7,350	44,800	45	350	—	—
Agricultural[7]	(3)	(3)	—	—	—	—
Chemical and metallurgical[8]	(3)	(3)	—	—	—	—
Special[9]	(3)	(3)	—	—	—	—
Unspecified:[10]						
Actual	7,640	49,700	3,850	21,700	11,800	78,200
Estimated	421	2,710	—	—	—	—
Total	16,400	102,000	24,700	142,000	13,500	87,300

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, riprap and jetty stone, and other coarse aggregate.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Includes agricultural limestone.
[8]Includes cement manufacture.
[9]Includes other fillers or extenders.
[10]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

GEORGIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	3,310	$11,900	$3.61
Plaster and gunite sands	388	1,320	3.39
Concrete products (blocks, bricks, pipe, decorative, etc.)	105	502	4.78
Asphaltic concrete aggregates and other bituminous mixtures	W	W	13.50
Road base and coverings	W	W	10.00
Fill	158	399	2.53
Other[2]	50	717	14.30
Unspecified:[3]			
Actual	735	1,740	2.37
Estimated	769	3,210	4.17
Total or average	5,520	19,800	3.59

W Withheld to avoid disclosing company proprietary data; included with "Other."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filtration.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

GEORGIA: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

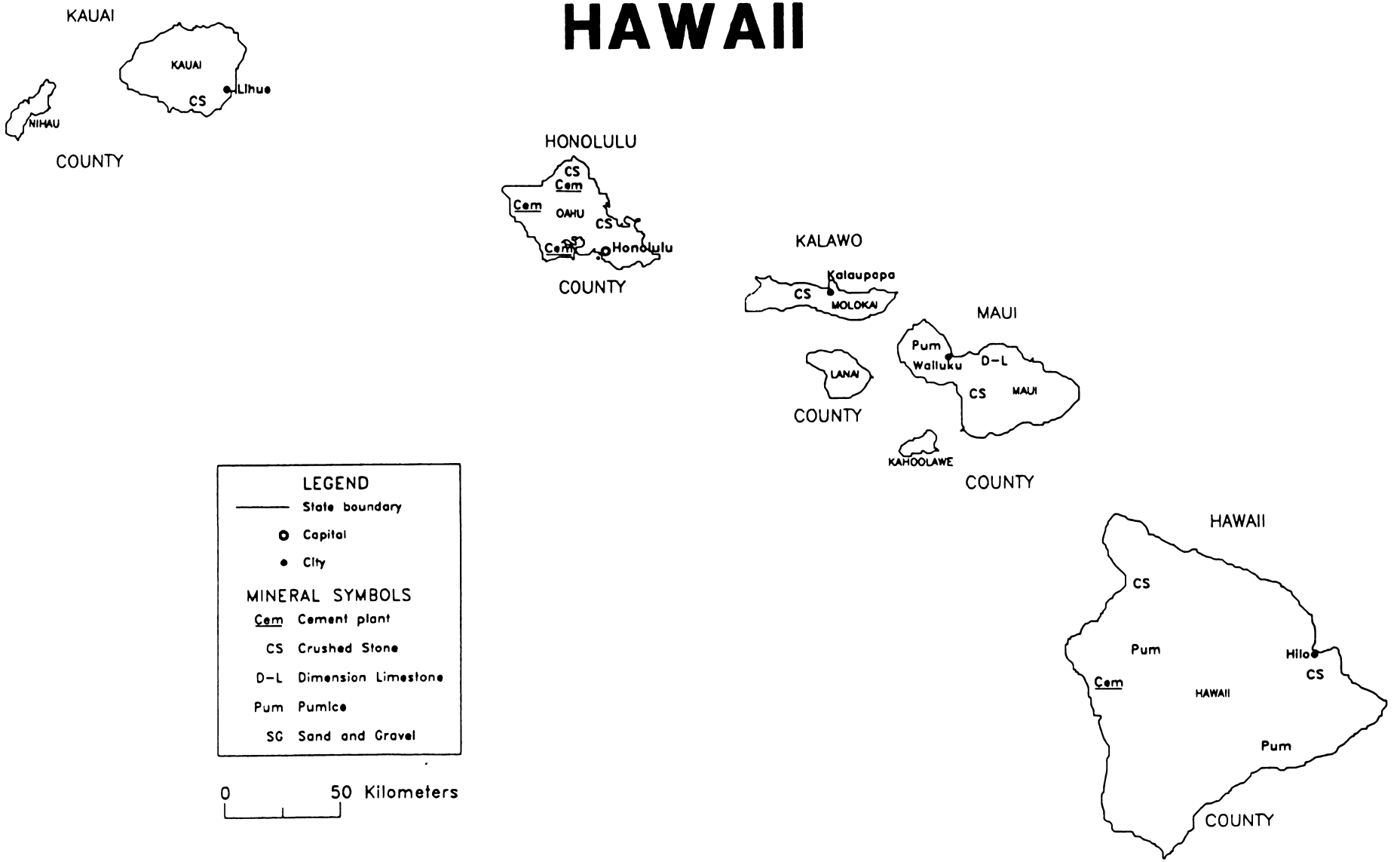
(Thousand metric tons and thousand dollars)

Use	District 2		District 3	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	629	2,600	3,170	11,100
Asphaltic concrete aggregates and road base materials[4]	9	55	174	688
Other miscellaneous uses[5]	—	—	24	374
Unspecified:[6]				
Actual	89	223	646	1,520
Estimated	118	536	652	2,670
Total	845	3,420	4,670	16,400

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill.
[5]Includes filtration.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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HAWAII



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF HAWAII

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Department of Land and Natural Resources of the State of Hawaii for collecting information on all nonfuel minerals.

Hawaii remained 43d among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $106 million, an 8% decrease from that of 1994. This followed a 16.5% decrease in 1994. The State accounted for about 0.5% the total U.S. nonfuel mineral production value.

Mining in Hawaii consisted mostly of the quarrying of stone to produce crushed stone and the excavation of sand and gravel from open pits, both for use by the Islands' construction industry. Most of the State's portland cement was produced at one manufacturing plant on the island of Oahu, Honolulu County. Hawaii's overall decrease in the value of mineral production in 1995, as well as in 1994, is mostly attributable to portland cement. While both crushed stone and construction sand and gravel values have increased during the past 2 years, portland cement production and value has declined since reaching the State's all-time high in 1992. In 1992, 520,000 metric tons of portland cement were produced at a value of almost $54 million.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN HAWAII[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	7,260	$880	6,000	$395	4,440	$316
Portland	do.	451,000	48,300	404,000	28,300	215,000	15,100
Sand and gravel (construction)	thousand metric tons	W	W	521	4,740	600	5,700
Stone (crushed)	do.	[3]8,460	[3]81,400	8,170	82,300	8,500	85,000
Combined value of other industrial minerals		XX	8,140	XX	(4)	XX	(4)
Total		XX	139,000	XX	[5]116,000	XX	[5]106,000

[e]Estimated. [p]Preliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; data excluded to avoid disclosing company proprietary data.

[4]Value excluded to avoid disclosing company proprietary data.

[5]Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

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TABLE 2

HAWAII: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	33	$400	$12.10
Riprap and jetty stone	59	660	11.20
Filter stone	36	300	8.33
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,290	14,600	11.30
Bituminous aggregate, coarse	104	821	7.89
Bituminous surface-treatment aggregate	W	W	8.63
Other graded coarse aggregate	W	W	11.60
Fine aggregate (-3/8 inch):			
Stone sand, concrete	1,070	13,000	12.10
Stone sand, bituminous mix or seal	555	5,250	9.46
Screening, undesignated	W	W	8.38
Other fine aggregate	W	W	13.20
Coarse and fine aggregates:			
Graded road base or subbase	574	5,700	9.93
Crusher run or fill or waste	821	6,210	7.57
Other coarse and fine aggregates	W	W	8.64
Other construction materials[3]	1,370	11,800	8.65
Agricultural:			
Agricultural limestone	(4)	(4)	17.20
Other agricultural uses	(4)	(4)	8.63
Chemical and metallurgical: Cement manufacture	278	2,170	7.82
Unspecified:[5]			
Actual	(4)	(4)	11.00
Estimated	1,930	20,900	10.80
Total	8,170	82,300	10.10

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes limestone, miscellaneous stone, traprock, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes roofing granules.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
HAWAII: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	6	1,420	$14,400	$10.20	6	1,000	$10,500	$10.50
Traprock	14	6,850	65,200	9.53	14	6,150	61,100	9.94
Volcanic cinder and scoria	6	192	1,750	9.13	7	143	1,080	7.52
Miscellaneous stone	(2)	(2)	(2)	(2)	10	876	9,650	11.00
Total	XX	8,460	81,400	9.63	XX	8,170	82,300	10.10

XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

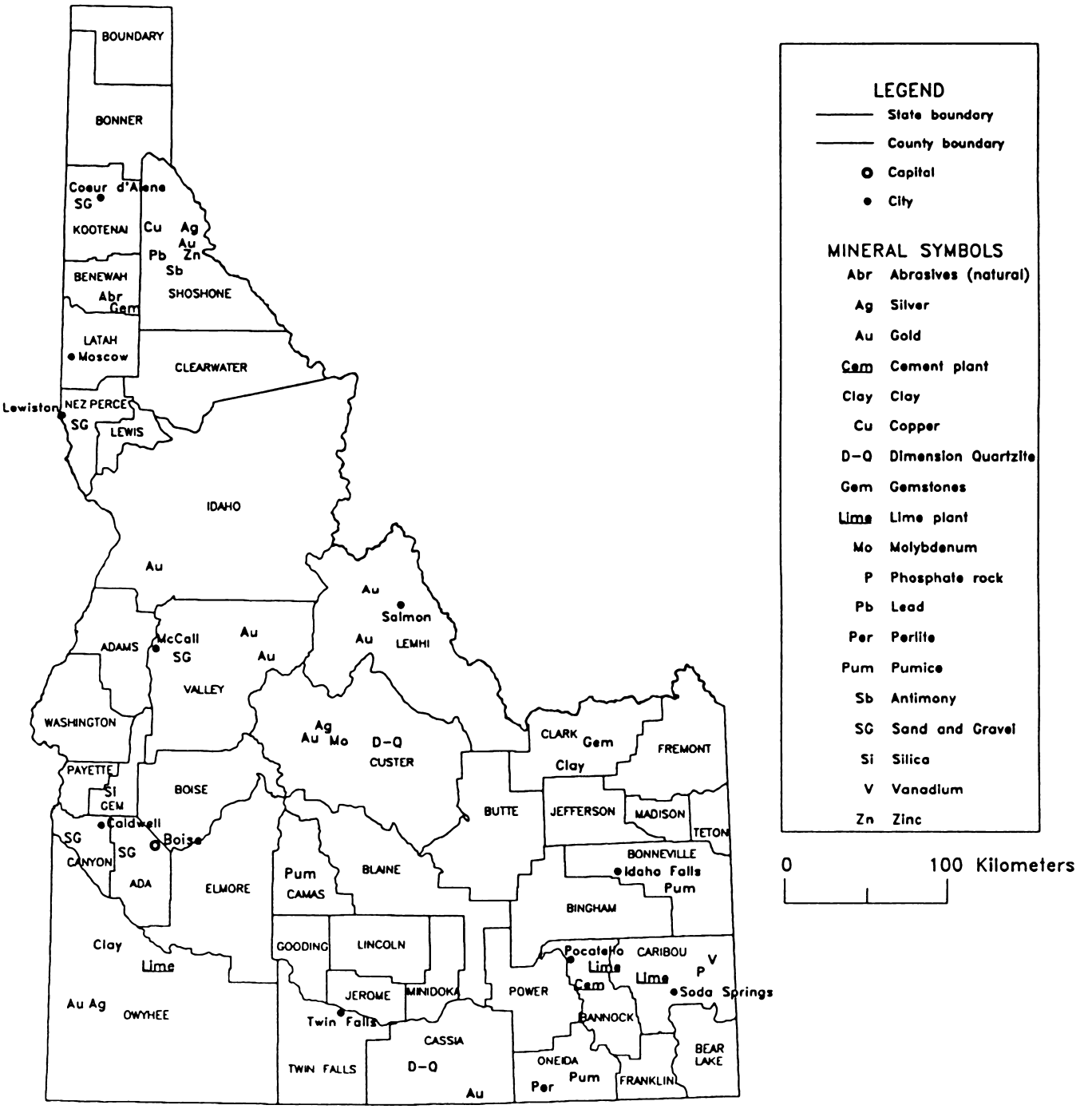
TABLE 4
HAWAII: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products	(2)	(2)	$11.80
Asphaltic concrete aggregates and roadbase materials	262	$2,230	8.50
Fill	(2)	(2)	3.60
Unspecified:[3] Estimated	1	1	1.00
Total or average	521	4,740	9.10

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Withheld to avoid disclosing company proprietary data; included in "Total."
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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IDAHO



LEGEND

- State boundary
- County boundary
- Capital
- City

MINERAL SYMBOLS

Abr	Abrasives (natural)
Ag	Silver
Au	Gold
Cem	Cement plant
Clay	Clay
Cu	Copper
D-Q	Dimension Quartzite
Gem	Gemstones
Lime	Lime plant
Mo	Molybdenum
P	Phosphate rock
Pb	Lead
Per	Perlite
Pum	Pumice
Sb	Antimony
SG	Sand and Gravel
Si	Silica
V	Vanadium
Zn	Zinc

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF IDAHO

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Idaho Geological Survey for collecting information on all nonfuel minerals.

Idaho ranked 32d among the 50 States in total nonfuel mineral production value[1] in 1995, climbing from 33d in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $399 million, a 15% increase from that of 1994. This followed a 26% increase in 1994 (based on final data) after an 11% decrease from 1992 to 1993. In 1995, more than 1% of the U.S. total nonfuel mineral production value came from Idaho. Industrial minerals, lead by phosphate rock and construction sand and gravel, accounted for about 58% of the State's total nonfuel mineral value. Of the remaining 42%, molybdenum, gold, silver, and lead, in descending order of value, were the leading metals.

Overall, the changes in the State's nonfuel mineral production value from 1993 through 1995 mostly resulted from shifting molybdenum and phosphate rock values. Significant increases occurred for both commodities in 1994 and 1995, following like decreases in 1993. Whereas value changes occurring for most other mineral commodities during 1994-95 were small relative to those of molybdenum and phosphate rock, garnet and vanadium ore values moderately increased in 1994. In 1995, other nonfuel mineral values that increased were: construction sand and gravel, silver, portland cement, vanadium ore, industrial sand and gravel, dimension stone, copper, umice and pumicite, zinc, gemstones, masonry cement, and kaolin clays. Decreases occurred in lime, garnet, gold, crushed stone, and lead.

Molybdenum had the largest single effect on the State's overall nonfuel mineral production value from 1992 through 1995. In the latter half of 1992, molybdenum production ceased at the State's only molybdenum mine, the Thompson Creek Mine, which remained closed in 1993 but was reopened in mid-1994. Molybdenum production value increased more than 140% from 1994 to 1995, the first full year of production since 1991.

Compared with USGS estimates of quantities produced in the other 49 States in 1995, Idaho remained the only State to produce vanadium ore and antimony; first of two garnet-producing States; second in phosphate rock; third in silver, lead, and pumice; fourth in molybdenum; sixth in feldspar; eighth in zinc; and ninth in copper. Of 14 U.S. gold-producing States, Idaho again ranked 10th. Additionally, the State's mining operations and plants produced

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN IDAHO[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$566	NA	$287	NA	$349
Phosphate rock	thousand metric tons	4,360	78,400	W	W	W	W
Pumice and pumicite	metric tons	43,400	327	W	W	W	W
Sand and gravel (construction)	thousand metric tons	[e]13,600	[e]44,900	14,500	46,300	14,700	49,200
Silver[3]	metric tons	190	26,200	W	W	W	W
Stone (crushed)	thousand metric tons	4,600	20,800	4,160	20,300	4,000	19,400
Combined value of antimony, cement, clays [common clays (1993), kaolin (1995)], copper, feldspar, [garnet (abrasive), gold, lead, lime, molybdenum (1994-95), sand and gravel (industrial), stone [dimension (1993, 1995), dimension marble and miscellaneous(1994)], vanadium ore, zinc, and values indicated by symbol W		XX	103,000	XX	279,000	XX	330,000
Total		XX	274,000	XX	346,000	XX	399,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

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significant quantities of construction and industrial sand and gravel and lime.

According to the Idaho Geological Survey,[2] mining activity in Idaho experienced ups and downs during 1995. Silver production in the famous Silver Valley continued, albeit at low levels relative to that of the early 1990's. While two major silver mines, the Lucky Friday Mine and the Sunshine Mine, remained in operation from 1994, there also was some production from the reopened Bunker Hill Mine. Hecla Mining Co. operated Lucky Friday and explored underground at the adjacent silver/lead Gold Hunter property in Shoshone County. Sunshine Mining and Refining Co. closed its Big Creek silver refinery, but operated the Sunshine Mine throughout the year. Sunshine Mining continued exploration of high-grade veins in the West Chance area. The pace of environmental cleanup of the Bunker Hill Superfund site and the Coeur d'Alene River accelerated.

Thompson Creek Mining Co. experienced a stable market for molybdenum produced from its large Thompson Creek open pit west of Challis. Stibnite Mines Inc., a seasonal open pit, heap-leach mining company, reopened in the summer, mining gold ore from its new Garnet Creek pit; permitting efforts were underway for expansion of operations at other nearby sites. Other operating gold mines included CSC Mining Co.'s small underground Rescue Mine in the town of Warren, Kinross Gold Corp.'s DeLamar Mine and its newly approved and constructed Stone Cabin Mine in Owyhee County, Pegasus Gold Inc.'s Black Pine Mine in Cassia County, U.S. Antimony Corp.'s small Yellowjacket Mine in Lemhi County, and two newly dedicated operations—Hecla's Grouse Creek unit in Custer County and FMC Gold Co.'s Beartrack Mine in Lemhi County. Hecla reported a disappointing year, announcing in October that ore grades at its Sunbeam pit at Grouse Creek were far lower and operating costs much higher than expected. The company took a $97 million write-down on the Grouse Creek Mine, but planned to keep it open nearterm and to continue with exploration and delineation drilling. Production at FMC's Beartrack project started in late summer after cyanide was first applied to its ore piles. Two open pit areas were being mined, and the pregnant solution (gold leachate) pond was covered with gray plastic balls to prevent the entry of waterfowl.

Major gold exploration projects included USMX Inc.'s program at the Dewey Mine in the Thunder Mountain District, American Gold Resources Corp.'s Humbug project and Newmont Gold Co.'s Musgrove project, both in Lemhi County, and Echo Bay Mine Ltd.'s Kilgore project in Clark County. Formation Capital Corp. continued major drilling programs, targeting underground cobalt deposits at the Black Pine and Sunshine projects in the Idaho Cobalt Belt in Lemhi County. The Sunshine project is in the Blackbird District, which was also the site of a major U.S. Environmental Protection Agency-supervised cleanup of the historic Blackbird cobalt mine site.

The State's phosphate industry was very active; all major facilities were in full production. Phosphate ore production from J. R. Simplot Co.'s Smoky Canyon Mine, FMC Corp.'s Dry Valley Mine, Rhone-Poulenc Basic Chemical Co.'s Rasmussen Ridge Mine, and Monsanto Co.'s Enoch Valley Mine were expected to total approximately 6.1 million metric tons (6.7 million short tons) in 1995. At plants in Soda Springs and Pocatello, Monsanto, Nu-West Industries Inc., FMC, and Simplot processed ore into elemental phosphorous or fertilizer products worth about four times the value of the raw ore. In late 1995, Nu-West was sold to Agrium, Inc., a Canadian firm. Kerr-McGee Chemical Corp. used the ferrophosphorus slag waste product generated by Monsanto's elemental phosphorous plant, as a source of vanadium in its vanadium extraction plant.

In other industrial minerals, Hess Pumice Products and Ash Grove Cement West Inc. had a good year with increased production in 1995. The Federal Government issued patents to Faxe Kalk Ltd., a Danish firm, to develop a 44-hectare (108-acre) site in Clark County containing travertine, a dimension limestone.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the Idaho Geological Survey.

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TABLE 2

IDAHO: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	24	$69	$2.88
Filter stone	W	W	4.72
Other coarse aggregate	W	W	2.20
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	1.10
Bituminous aggregate, coarse	88	404	4.59
Bituminous surface-treatment aggregate	90	408	4.53
Railroad ballast	W	W	4.76
Coarse and fine aggregates:			
Graded road base or subbase	991	3,940	3.98
Unpaved road surfacing	872	4,120	4.72
Crusher run or fill or waste	34	84	2.47
Other coarse and fine aggregates	W	W	2.48
Other construction materials	126	338	2.68
Agricultural: Agricultural limestone	(3)	(3)	16.50
Chemical and metallurgical:			
Cement manufacture	(3)	(3)	2.73
Flux stone	457	4,390	9.60
Unspecified:[4]			
Actual	(3)	(3)	2.34
Estimated	997	5,190	5.20
Total	4,160	20,300	4.89

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes granite, limestone, miscellaneous stone, quartzite, shell, traprock, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

IDAHO: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	6	316	$1,430	$4.51	6	407	$1,400	$3.44
Granite	6	382	1,830	4.80	7	281	1,110	3.94
Traprock	38	2,850	10,900	3.82	31	2,230	9,440	4.24
Shell	2	W	W	4.83	2	W	W	4.08
Volcanic cinder and scoria	1	W	W	5.11	1	W	W	5.67
Quartzite	11	564	4,670	8.28	7	556	1,800	3.24
Miscellaneous stone	7	418	1,590	3.80	8	642	3,370	5.24
Total	XX	4,600	20,800	4.51	XX	4,160	20,300	4.89

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.

TABLE 4

IDAHO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

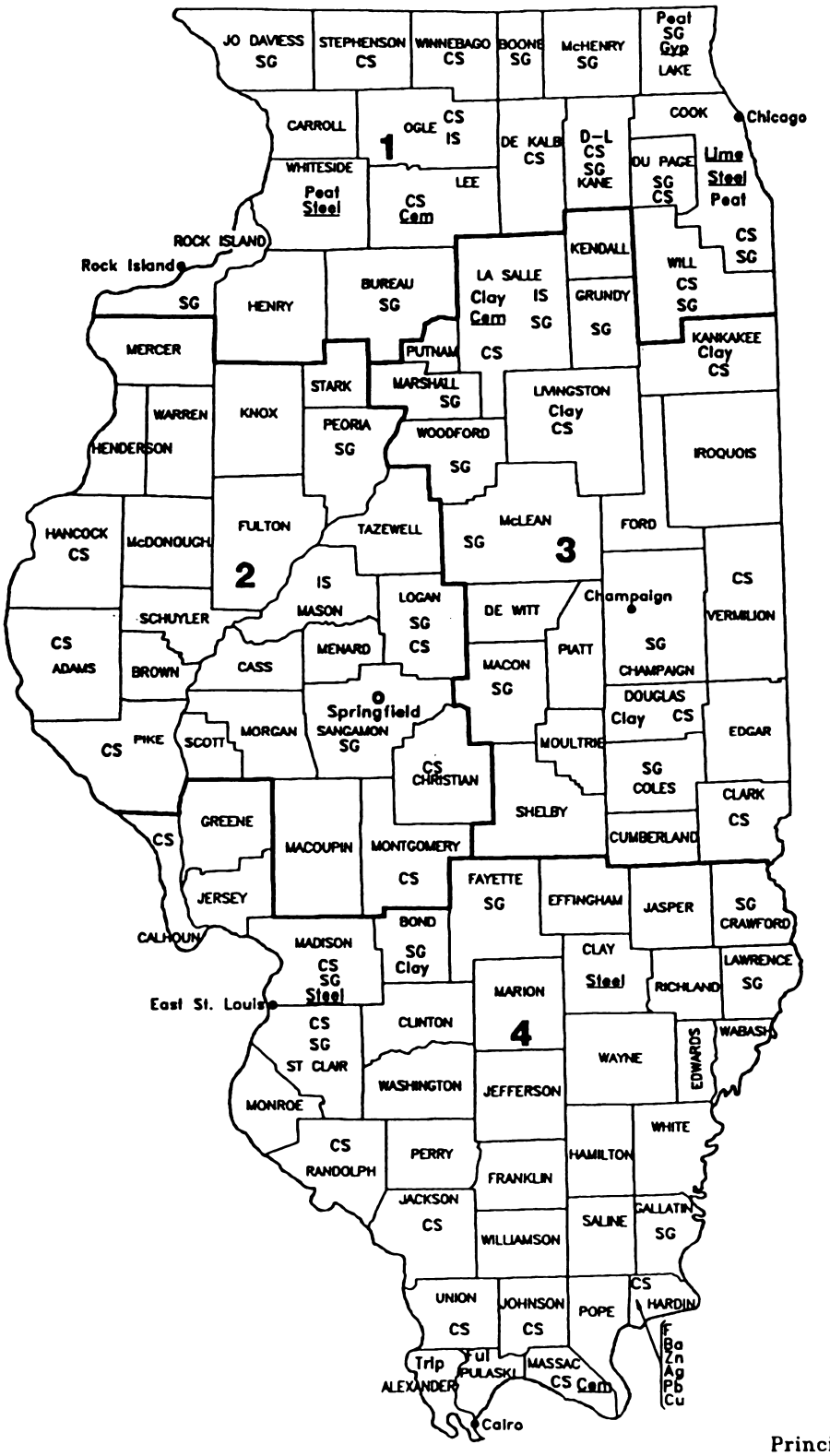
Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	3,310	$13,600	$4.10
Concrete products (blocks, brick, pipe, decorative, etc.)	102	459	4.50
Asphaltic concrete aggregates and other bituminous mixtures	1,310	4,740	3.63
Road base and coverings[3]	6,000	16,300	2.71
Fill	650	1,140	1.75
Snow and ice control	54	227	4.20
Other[4]	64	332	5.19
Unspecified:[5]			
Actual	1,340	3,690	2.76
Estimated	1,640	5,880	3.58
Total or average	14,500	46,300	3.20

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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ILLINOIS



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Ba	Barite
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
Cu	Copper
D-L	Dimension Limestone
F	Fluorspar
Ful	Fuller's earth
Gyp	Calcined Gypsum
IS	Industrial Sand
Lime	Lime plant
Pb	Lead
Peat	Peat
SG	Sand and Gravel
Steel	Iron and Steel plant
Trip	Tripoli
Zn	Zinc

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF ILLINOIS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the State Geological Survey, Illinois Department of Energy and Natural Resources, for collecting information on all nonfuel minerals.

In 1995, for the 6th year in a row and the 8th in the last 10 years, Illinois ranked 16th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $820 million, a decrease from the $823 million in 1994. This followed a 12% increase in 1994 (based on final 1994 data) from that of 1993. The State accounted for more than 2% of the total U.S. nonfuel mineral production value.

More than 97% of Illinois' total nonfuel mineral value in 1995 resulted from the production of industrial minerals. In terms of mineral value, crushed stone was the State's leading commodity, accounting for about 41% of the total, followed by portland cement with 19%, and construction sand and gravel with 18%. Decreases in crushed stone and construction sand and gravel values during 1995 were offset for the most part by increases in values for common clay, fuller's earth clays, and lime. The only metal produced in significant quantities from Illinois' mines was zinc. Compared with that of 1994, the values of the following commodities increased in 1995: portland cement, industrial sand and gravel (marginal increase), lime, fuller's earth, zinc, common clays, and copper. Decreases occurred in crushed stone, construction sand and gravel, fluorspar (marginal decrease), gemstones, and barite.

Compared with USGS estimates of the quantities of minerals produced in the other 49 States during 1995, Illinois remained the only fluorspar-producing State; first in industrial sand and gravel; one of the top four States producing fuller's earth; and seventh in lime, zinc, and barite. Changes in ranking occurred for four commodities. Illinois climbed from 9th in the manufacture of portland cement and 19th in the mined production of common clays to 8th for both commodities. The State dropped from fifth to sixth in the production of crushed stone and from sixth to seventh in construction sand and gravel. Raw steel was produced in Illinois, but it was processed from materials obtained from other domestic and foreign sources. Illinois continued to be the Nation's fifth

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN ILLINOIS[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	2,430,000	$123,000	2,590,000	$151,000	2,600,000	$152,000
Clays[3]	thousand metric tons	477	1,090	494	1,170	1,070	4,140
Gemstones		NA	328	NA	376	NA	269
Sand and gravel:							
Construction	thousand metric tons	e34,500	e137,000	37,900	150,000	35,000	144,000
Industrial	metric tons	4,220,000	61,700	4,420,000	65,700	4,410,000	65,800
Stone (crushed)[4]	thousand metric tons	61,500	315,000	62,600	353,000	59,500	340,000
Combined value of barite, cement [masonry (1994-95)], clays (fuller's earth), copper, fluorspar, (lead (1993-94), lime, peat, silver, stone [crushed sandstone (1993), crushed miscellaneous (1994-95), dimension (1993, 1995), dimension dolomite (1994)], tripoli, and zinc		XX	95,900	XX	102,000	XX	114,000
Total		XX	734,000	XX	823,000	XX	820,000

eEstimated. pPreliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Excludes certain stones; kind and value included with "Combined value" data.

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leading raw steel-manufacturing State with an estimated output of 6.8 million metric tons (7.5 million short tons), as reported by the American Iron and Steel Institute.

The remainder of this narrative was derived from information provided by the Illinois State Geological Survey (ISGS). The ISGS reported a reorganization of Illinois mineral-resource-related agencies into one department in 1995. The Department of Conservation, Department of Mines and Minerals (DMM), Illinois State Geological Survey, and other small agencies were brought together under the new Department of Natural Resources (DNR), about 75% or more of the DNR having come from the former Department of Conservation. The Illinois legislature enacted two pieces of legislation that related to the mineral industry during 1995. The existing Surface Mining Land Conservation and Reclamation Act was amended, effective July 1, 1995. The amended legislation enabled the Office of Mines and Minerals of the DNR, formerly DMM, to collect annual fees from all operating noncoal surface mines; it promulgated that regulations concerning blasting standards be established for mining and quarrying operations; and required that blasters be certified with the State. Introduction of the blasting standard regulations were expected during 1996 and will take effect 1 year after adoption. The second bill, a geologist registration bill, also was enacted, effective July 1, 1996. The law, to be administered by the Illinois Department of Professional Regulation, requires that a geologist who signs official reports submitted to public authorities in Illinois must be officially registered in the State.

An era is about to come to an end for Ozark-Mahoning Co. (OMC), a subsidiary of Elf Atochem North America, Inc. OMC announced the closing of its last two fluorspar mines in Hardin County, the last two operating fluorspar mines in the United States. Fluorspar has been mined commercially in Hardin County since about 1870. Mineral collectors will find fluorite, Illinois' State mineral, increasingly difficult to obtain because the availability of specimens up to now has depended on a company policy that allowed miners to carry specimens out of the mines in their "lunch pails." The company laid off 103 of 128 employees, effective January 31, 1996, retaining those necessary to operate the product drying system, conduct reclamation work, and administer the remaining company interests in the area. The closing was expected to be a severe blow to the local economy because Ozark-Mahoning was the county's largest single employer in a county of about 5,000 population. Some exploratory core drilling had been performed in 1995, but there was little chance of anyone opening a new mine unless the price of fluorspar improved.

The Calcium Carbonate Division of J. M. Huber Corp., a producer of chemical and filler (or whiting) grade of calcium carbonate at its Quincy, IL, location as well as at other corporation mineral-producing divisions, were combined into one large division under the name Engineered Minerals Division of J. M. Huber Corp. Golden Cat Corp., which makes cat box filler products from the absorbent clay it mines from its southern Illinois operations, near Olmsted in Pulaski County, was purchased by Ralston Purina Company of St. Louis, MO. Chicago-based Material Service Corp., a subsidiary of General Dynamics Corp., sold its ready-mixed concrete operations and its concrete pipe plants to smaller local companies. The operations were sold in order to streamline the company's overall operations and to concentrate more on its mining operations. Material Service is one of the largest construction aggregate producers in the State, having 3 sand and gravel pits and 8 limestone and dolomite quarries, including its Thornton Quarry that is ranked as 1 of the 10 largest quarries in the country.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

ILLINOIS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	674	$3,290	$4.88
Riprap and jetty stone	429	2,670	6.23
Filter stone	264	1,460	5.52
Other coarse aggregate	453	2,120	4.67
Coarse aggregate, graded:			
Concrete aggregate, coarse	5,450	28,300	5.19
Bituminous aggregate, coarse	4,320	26,400	6.10
Bituminous surface-treatment aggregate	1,130	6,390	5.64
Railroad ballast	586	2,970	5.07
Other graded coarse aggregate	1,130	5,860	5.17
Fine aggregate (-3/8 inch):			
Stone sand, concrete	1,210	5,690	4.69
Stone sand, bituminous mix or seal	191	878	4.60
Screening, undesignated	819	3,100	3.78
Other fine aggregate	2	14	7.00
Coarse and fine aggregates:			
Graded road base or subbase	10,000	43,700	4.35
Unpaved road surfacing	1,640	7,910	4.81
Crusher run or fill or waste	274	1,250	4.54
Other construction materials[3]	128	562	4.39
Agricultural: Agricultural limestone[4]	2,300	10,900	4.74
Chemical and metallurgical: Cement manufacture[5]	2,510	9,370	3.73
Special:			
Mine dusting or acid water treatment	15	161	10.70
Other fillers or extenders[6]	667	26,600	39.90
Unspecified:[7]			
Actual	19,800	114,000	5.76
Estimated	8,560	49,600	5.80
Total	62,600	353,000	5.64

[1]Includes dolomite, limestone, and limestone-dolomite; excludes miscellaneous stone from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes roofing granules and terrazzo and exposed aggregate.
[4]Includes poultry grit and mineral food.
[5]Includes chemical stone for alkali and flux stone.
[6]Includes asphalt fillers or extenders.
[7]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

ILLINOIS: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993[2]				1994[3]			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[4]	152	46,900	$243,000	$5.17	145	47,600	$276,000	$5.79
Dolomite	18	14,500	72,600	4.99	17	14,900	76,800	5.15
Total	XX	61,500	315,000	5.13	XX	62,600	353,000	5.64

XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Excludes sandstone from State total to avoid disclosing company proprietary data.

[3]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

[4]Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4

ILLINOIS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	779	3,720	177	1,120	359	2,130	505	2,580
Coarse aggregate, graded[4]	W	W	W	W	W	W	1,900	9,520
Fine aggregate (-3/8 inch)[5]	W	W	W	W	W	W	715	(6)
Coarse and fine aggregate[7]	6,140	26,700	706	3,540	2,290	10,500	2,860	12,300
Other construction materials	8,670	47,200	310	1,830	3,350	18,300	—	—
Agricultural[8]	541	2,370	324	2,180	690	3,390	741	2,940
Chemical and metallurgical[9]	(6)	(6)	—	—	(6)	(6)	(6)	(6)
Special[10]	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)
Unspecified:[11]								
Actual	(6)	(6)	(6)	(6)	2,460	8,930	4,960	28,000
Estimated	3,540	20,500	1,560	7,180	1,730	11,300	1,730	10,700
Total	30,400	153,000	7,390	69,600	10,900	57,800	13,900	72,500

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filler stone, macadam, riprap and jetty stone, and other coarse aggregate.

[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[6]Withheld to avoid disclosing company proprietary data; included with "Total."

[7]Includes graded road base or subbase, roofing granules, terrazzo and exposed aggregate, unpaved road surfacing, and crusher run (select material or fill).

[8]Includes agricultural limestone and poultry grit and mineral food.

[9]Includes cement manufacture, chemical stone for alkali works, and flux stone.

[10]Includes asphalt fillers or extenders, mine dusting or acid water treatment, and other fillers or extenders.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

ILLINOIS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,170	$26,200	$3.65
Plaster and gunite sands	318	1,180	3.71
Concrete products (blocks, bricks, pipe, decorative, etc.)	850	3,640	4.28
Asphaltic concrete aggregates and other bituminous mixtures	1,870	7,630	4.09
Road base and coverings[2]	6,580	32,300	4.91
Fill	4,500	15,600	3.46
Snow and ice control	68	362	5.32
Filtration	24	167	6.96
Other[3]	77	602	7.82
Unspecified:[4]			
Actual	12,600	48,900	3.88
Estimated	3,860	13,000	3.36
Total or average	37,900	150,000	3.94

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes railroad ballast and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

ILLINOIS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

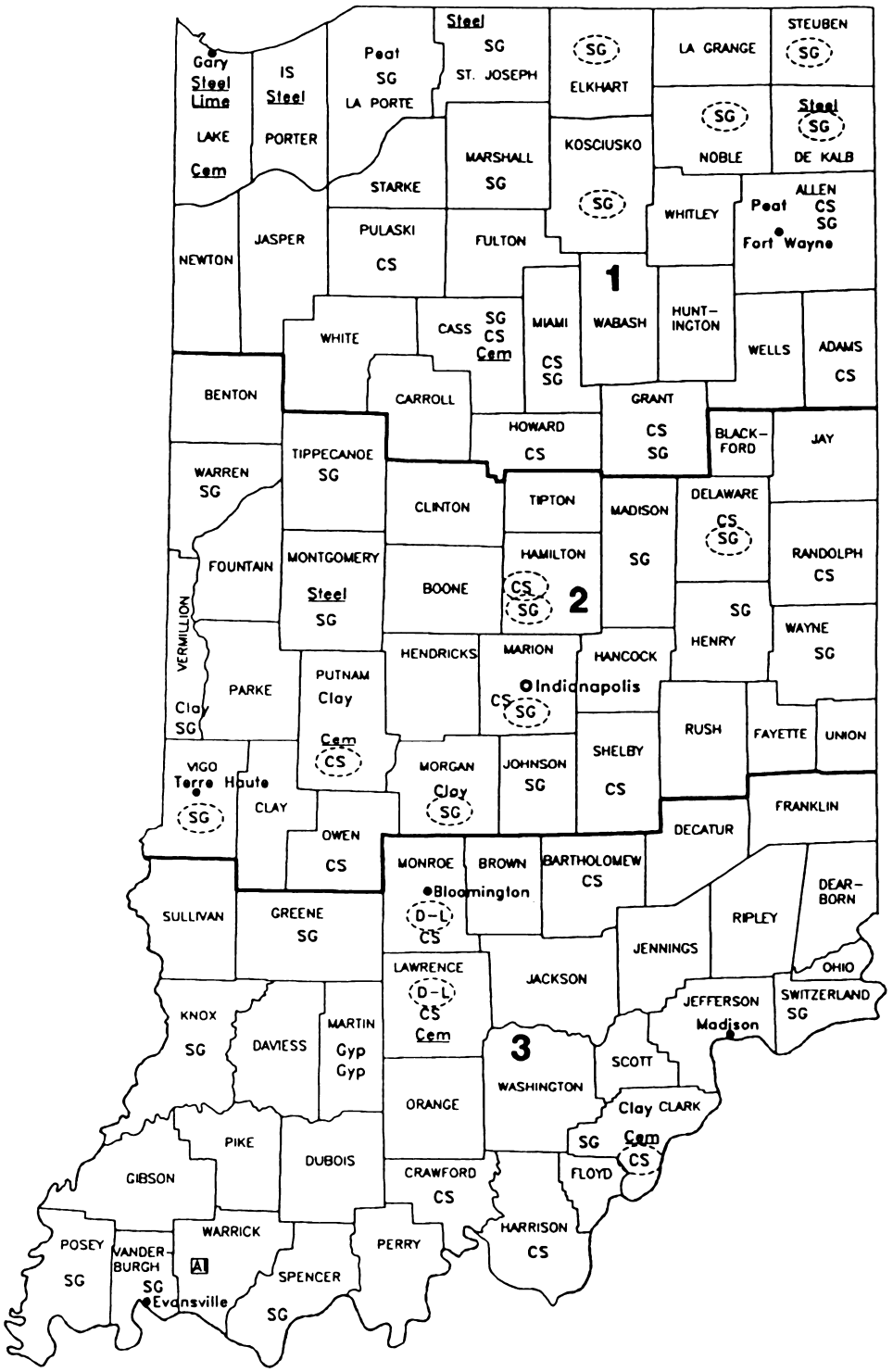
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	3,830	15,200	1,400	3,970	1,980	8,380	1,120	3,490
Asphaltic concrete aggregates and road base materials[3]	8,900	40,800	1,330	3,980	1,960	8,420	763	2,300
Snow and ice control	29	241	24	68	15	53	(4)	(4)
Other miscellaneous uses[5]	25	213	20	105	57	451	—	—
Unspecified:[6]								
Actual	10,300	42,500	872	3,610	1,430	2,820	—	—
Estimated	1,500	5,090	84	264	1,340	4,110	929	3,510
Total	24,600	104,000	3,730	12,000	6,780	24,200	2,820	9,300

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill and road and other stabilization (cement).
[4]Less than 1/2 unit.
[5]Includes railroad ballast and roofing granules.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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INDIANA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

A	Aluminum plant
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-L	Dimension Limestone
D-S	Dimension Sandstone
Gyp	Gypsum
IS	Industrial sand
Lime	Lime plant
Peat	Peat
SG	Sand and Gravel
Steel	Iron and Steel plant
(oval)	Concentration of mineral operations

0 — 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF INDIANA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Geological Survey, Indiana Department of Natural Resources, for collecting information on all nonfuel minerals.

Indiana ranked 23d among the 50 States in total nonfuel mineral production value[1] in 1995, dropping from 21st in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $574 million, a 3% increase compared with that of 1994 (based on final 1994 data). This followed a 17.5% increase from 1993 to 1994. Indiana's nonfuel mineral production value exceeded one-half billion dollars in 1995, the State having first reached this milestone in 1994. Compared with 1994, the values of all nonfuel mineral commodities produced in the State (see table 1) increased except for those of dimension stone and peat. Both of these experienced moderate decreases. The State accounted for about 1.5% of the U.S. total nonfuel mineral production value.

Compared with USGS estimates of quantities produced in the other 49 States during 1995, Indiana remained 2d in dimension stone, 7th in gypsum, and 10th in construction sand and gravel. The State climbed from 3d to 2d in the production of masonry cement; from 14th to 10th in common clay production; and was 9th in the production of peat. While not ranking among the top 10 States, Indiana mines, nonetheless, produced significant quantities of crushed stone. Similarly, manufacturing plants within the State were significant producers of portland cement and lime. In 1995, Indiana remained 11th in the production of portland cement and lime and 12th in crushed stone. The State's mines exclusively produce industrial minerals and coal; all raw steel and primary aluminum produced are processed from materials received from other domestic and foreign sources. Indiana continued to lead the Nation in the production of raw steel with an estimated output of close to 21 million metric tons (23 million short tons), as reported by the American Iron and Steel Institute. Of similar importance, the State remained third in the production of primary aluminum.

The remainder of this narrative was derived from information provided by the Indiana Geological

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN INDIANA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	2,060,000	$109,000	2,290,000	$132,000	2,300,000	$133,000
Clays	thousand metric tons	[3]600	[3]2,540	[3]774	[3]2,540	1,090	6,930
Gemstones		NA	47	NA	29	NA	36
Peat	metric tons	24,000	W	23,000	W	W	W
Sand and gravel (construction)	thousand metric tons	[e]27,000	[e]103,000	28,100	108,000	27,900	109,000
Stone:							
Crushed	do.	36,900	166,000	45,900	211,000	48,800	232,000
Dimension	metric tons	[4]156,000	[4]22,900	173,000	25,800	168,000	18,600
Combined value of cement (masonry), clays [ball (1993-94)], gypsum (crude), lime, sand and gravel (industrial), stone [dimension sandstone (1993)], and values indicated by symbol W		XX	70,400	XX	75,400	XX	74,500
Total		XX	473,000	XX	555,000	XX	574,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" figure.

[4]Excludes certain stones; kind and value included with "Combined value" figure.

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Survey. Indiana's aggregate mineral industry, composed of crushed stone and construction sand and gravel producers, continued to show significant activity in 1995. Late in 1994, the Kentucky Stone Co. acquired France Stone Co.'s Greencastle ground limestone plant and Putnamville Stone Quarry through a Hanson PLC intercompany transfer. Both the quarry and the Greencastle plant for which Putnamville provides stone are located in Putnam County. Aggrock Quarries Inc. opened a quarry at ESSROC Materials, Inc.'s property near Speed, Clark County, utilizing stone not needed for ESSROC's cement manufacture. Sellersburg Stone Co., Inc., expanded its quarry operation while Liters Quarry of Indiana Inc. completed construction of a new stone processing plant both in Clark County. Erie Stone Co., a division of Irving Materials Inc., closed its Markle crushed stone quarry in Huntington County; the quarry had been in operation since 1968. Mulzer Crushed Stone Co., Inc., made plans for a 1996 opening of a new crushed stone operation near Paoli, Orange County. A town meeting was held in Carp, Owen County, to discuss the proposed development of a crushed stone quarry by Rogers Group Inc.

In the sand and gravel industries, Vulcan Materials Co. sold its Fremont and Angola plants in Steuben County and its Kimmel operation in Noble County to Merritt Sand and Gravel, Inc. Vulcan also purchased the Barker Pit in Boone County and the Harner and Daugherty Pits in Tippecanoe County from Fairfield Builders Supply Corp. Elkhart County Gravel Corp. opened a new pit near Middlebury, Elkhart County, and Rogers Group made two acquisitions: Martinsville Sand and Gravel Co., Inc., in Morgan County and Wabash Gravel Co., Inc., in Warren County. U.S. Silica Co. sold its industrial sand plant near Elizabeth, Harrison County, to White Sands Mining Co., a division of The Sand Trap, Inc.

In other aggregate-related news, the Indiana Department of Transportation (INDOT) mandated that, as of September 1, 1997, all aggregate companies selling materials to INDOT projects will be required to participate in the State-administered Certified Aggregate Producers Program (CAPP). To be on INDOT's vendors list at least one person in the company must be certified by CAPP or be participating in the certification process. The program, initiated by INDOT, was developed and is administered by a committee, or Board, of professionals that includes representatives from INDOT, the aggregate industry, Academia, and other government agencies. The foremost purpose of CAPP is to promote quality control in construction projects within the State. Following a week-long quality control and material specification course, the person to be certified is given additional periodic instruction and testing. Full certification is usually achieved in under a year and is good for 3 years, after which a recertification test must be taken. Concerning environmental issues, the Indiana Mineral Aggregates Association in cooperation with the Indiana Department of Environmental Management was in the process of completing an environmental compliance manual for the aggregates industry.

Dimension limestone producers experienced a relatively active year; prices for dimension stone increased in the latter part of the year. During the year, B. G. Hoadley Quarries Inc. continued to expand, opening another dimension limestone quarry in Monroe County.

United States Gypsum Corp. (USG) offered a "land for mining rights" swap to the U.S. Forest Service. USG acquired five southern Indiana tracts of land totaling 285 hectares (703 acres) that the Forest Service had been unable to purchase owing to insufficient funds. In exchange, USG requested the rights to develop an underground gypsum mine under 470 hectares (1,162 acres) of the Hoosier National Forest, this land bordering its current operation near Shoals, Martin County. The land above the gypsum reserves would remain part of the forest. Little disturbance to the forest's surface was anticipated because the mining would take place 120 to 150 meters (400 to 500 feet) underground and would be accessed underground from USG's adjacent mining operation. The plan remained under discussion but had reportedly received considerable public support.

The Indiana Geological Survey (IGS) completed its mineral resource assessment of Putnam County. While the assessment includes all mineral resources, the county's limestone rock resources were the main target of the study. Additionally, IGS, in cooperation with Indianapolis Power and Light Co., an Indiana electric utility company, received a grant from the Indiana Department of Commerce for a Statewide study of limestones most suitable for use in flue gas desulfurizat ion scrubber systems. During the year, IGS updated its *Directory of Industrial Minerals Producers in Indiana*.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

INDIANA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	59	$216	$3.66
Riprap and jetty stone	1,050	4,630	4.40
Filter stone	294	1,330	4.53
Other coarse aggregate	280	1,470	5.26
Coarse aggregate, graded:			
Concrete aggregate, coarse	4,920	19,000	3.86
Bituminous aggregate, coarse	3,280	13,800	4.21
Bituminous surface-treatment aggregate	1,520	5,850	3.84
Railroad ballast	387	1,650	4.26
Other graded coarse aggregate	W	W	4.16
Fine aggregate (-3/8 inch):			
Stone sand, concrete	199	845	4.25
Stone sand, bituminous mix or seal	198	754	3.81
Screening, undesignated	147	575	3.91
Other fine aggregate	W	W	4.13
Coarse and fine aggregates:			
Graded road base or subbase	4,200	20,000	4.75
Unpaved road surfacing	2,830	12,500	4.43
Terrazzo and exposed aggregate	(3)	4	22.10
Crusher run or fill or waste	743	3,240	4.36
Other coarse and fine aggregates	1,350	6,670	4.94
Other construction materials	389	1,450	3.73
Agricultural: Agricultural limestone[4]	1,410	6,010	4.25
Chemical and metallurgical:			
Cement manufacture	3,510	6,110	1.74
Flux stone	(3)	(3)	9.54
Sulfur oxide removal	302	1,010	3.35
Special: Asphalt fillers or extenders	(3)	(3)	7.82
Unspecified:[6]			
Actual	15,700	88,000	5.61
Estimated	2,900	14,400	4.95
Total	45,900	211,000	4.61

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, limestone, and limestone-dolomite.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Less than 1/2 unit.
[4]Includes poultry grit and mineral food, and other agricultural uses.
[5]Withheld to avoid disclosing company proprietary data; included with "Total."
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
INDIANA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	72	r32,400	r$146,000	r$4.49	71	40,000	$183,000	$4.58
Dolomite	r10	r4,540	r20,600	r4.54	13	5,840	28,000	4.79
Total	XX	36,900	166,000	4.50	XX	45,900	211,000	4.61

rRevised. XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4
INDIANA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	575	3,050	W	W	W	W
Coarse aggregate, graded[3]	2,330	10,500	680	3,840	7,140	26,100
Fine aggregate (-3/8 inch)[4]	278	1,190	W	W	W	W
Coarse and fine aggregate[5]	4,710	19,300	1,790	9,640	2,620	13,500
Other construction materials	—	—	504	2,530	1,230	4,380
Agricultural[6]	619	2,840	142	777	653	2,390
Chemical and metallurgical[7]	(8)	(8)	(8)	(8)	2,450	5,560
Special[9]	(8)	(8)	(8)	(8)	—	—
Unspecified:[10]						
Actual	3,120	15,000	6,660	42,900	5,910	30,100
Estimated	1,760	8,960	494	2,370	651	3,040
Total	14,000	62,400	11,200	63,600	20,600	85,100

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[6]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[7]Includes cement manufacture, flux stone, and sulfur oxide removal.
[8]Withheld to avoid disclosing company proprietary data; included with "Total."
[9]Includes asphalt fillers or extenders.
[10]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,340	$27,500	$3.75
Plaster and gunite sands	71	346	4.87
Concrete products (blocks, bricks, pipe, decorative, etc.)	254	1,050	4.13
Asphaltic concrete aggregates and other bituminous mixtures	2,210	8,900	4.02
Road base and coverings[2]	1,100	4,980	4.52
Fill	2,270	7,020	3.10
Snow and ice control	238	801	3.37
Filtration	34	250	7.35
Other[3]	82	452	5.51
Unspecified:[4]			
Actual	11,900	46,900	3.96
Estimated	2,640	9,700	3.67
Total or average	28,100	108,000	3.84

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes railroad ballast and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

INDIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

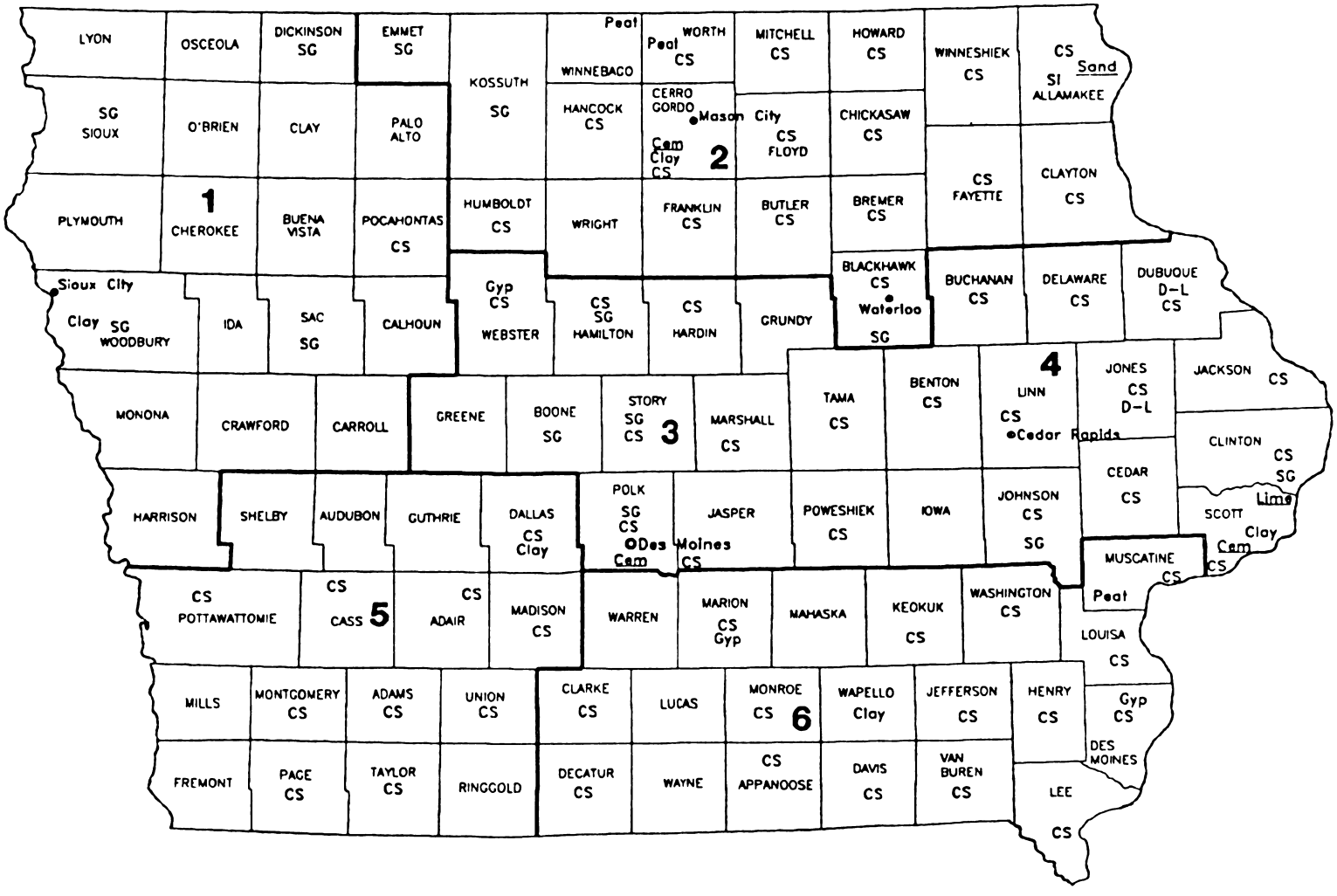
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	2,120	7,040	3,090	15,400	2,460	6,430
Asphaltic/bituminous mixtures	1,060	3,630	716	3,940	439	1,330
Road base and coverings[3]	508	2,230	510	2,280	83	463
Fill	515	1,380	1,330	4,740	419	900
Other miscellaneous uses[4]	239	1,040	95	385	18	82
Unspecified:[5]						
Actual	830	2,970	7,950	32,400	3,080	11,500
Estimated	1,220	4,860	703	2,530	716	2,310
Total	6,490	23,200	14,400	61,700	7,210	23,100

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement and lime).
[4]Includes filtration, railroad ballast, roofing granules, and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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IOWA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF IOWA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Geological Survey Bureau, Division of Energy and Geological Resources, Iowa Department of Natural Resources, for collecting information on all nonfuel minerals.

In 1995, for the 3d consecutive year, Iowa ranked 26th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $484 million, a 7% increase from that of 1994. This followed a 13.5% increase in 1994 (based on final data). The State accounted for more than 1% of the total U.S. nonfuel mineral production value. Crushed stone remained the leading commodity, accounting for more than 45% of the State's total nonfuel mineral value, followed by portland cement with nearly 37% and construction sand and gravel with about 11%. Compared with 1994, the following mineral commodity values increased in 1995: crushed stone, portland cement, crude gypsum, industrial sand and gravel, peat, and gemstones. Decreases occurred in construction sand and gravel, lime, masonry cement, and common clays.

Compared with USGS estimates of quantities produced in the other 49 States, Iowa remained 2d in crude gypsum and rose from 10th to 7th in portland cement. Additionally, significant quantities of crushed stone, construction sand and gravel, masonry cement, dimension stone, common clays, and industrial sand and gravel were produced in the State. No metals were mined in Iowa; all of the State's metal production resulted from the processing of materials acquired from other domestic and foreign sources.

According to the Geological Survey Bureau of the Iowa Department of Natural Resources, Wendling Quarries Inc. of DeWitt, in Clinton County, acquired all of Vulcan Materials Co.'s Iowa properties, most of which were crushed stone operations.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN IOWA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	2,300,000	$136,000	2,390,000	$153,000	2,830,000	$181,000
Clays	thousand metric tons	358	1,670	384	1,520	317	1,280
Gemstones		NA	46	NA	50	NA	57
Gypsum (crude)	thousand metric tons	1,990	12,300	2,210	12,700	2,240	12,900
Peat	metric tons	W	W	5,000	W	W	W
Sand and gravel (construction)	thousand metric tons	[e]16,600	[e]64,700	15,300	58,200	14,000	53,900
Stone (crushed)	do.	30,500	169,000	[3]36,600	[3]211,000	[3]37,500	[3]219,000
Combined value of cement (masonry), lime, sand and gravel (industrial), stone [crushed dolomite and miscellaneous (1994-95), dimension], and values indicated by symbol W		XX	13,900	XX	15,400	XX	15,800
Total		XX	398,000	XX	451,000	XX	484,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; values included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; value included with "Combined value" data.

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TABLE 2

IOWA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	137	$850	$6.20
Riprap and jetty stone	164	1,090	6.66
Filter stone	115	556	4.83
Other coarse aggregate	329	1,900	5.78
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,120	8,060	7.23
Bituminous aggregate, coarse	488	2,950	6.04
Bituminous surface-treatment aggregate	339	1,290	3.81
Railroad ballast	178	1,030	5.81
Other graded coarse aggregate	W	W	5.44
Fine aggregate (-3/8 inch):			
Stone sand, concrete	49	244	4.98
Stone sand, bituminous mix or seal	W	W	7.71
Screening, undesignated	166	588	3.54
Other fine aggregate	39	203	5.21
Coarse and fine aggregates:			
Graded road base or subbase	2,180	12,100	5.55
Unpaved road surfacing	3,000	16,000	5.34
Terrazzo and exposed aggregate	8	51	6.38
Crusher run or fill or waste	221	631	2.86
Other coarse and fine aggregates[3]	1,220	7,180	5.91
Agricultural: Agricultural limestone[4]	1,190	10,600	8.93
Chemical and metallurgical:			
Cement manufacture	2,810	20,100	7.13
Lime manufacture	(5)	(5)	3.95
Flux stone	(5)	(5)	5.94
Glass manufacture	(5)	(5)	10.90
Special:			
Asphalt fillers or extenders	(5)	(5)	13.70
Other fillers or extenders	1	5	5.00
Unspecified:[6]			
Actual	9,360	52,200	5.58
Estimated	12,900	69,300	5.39
Total	36,600	211,000	5.75

W Withheld to avoid disclosing company proprietary data; included with "Other coarse and fine aggregates."

[1]Includes dolomite, limestone, and limestone-dolomite; excludes dolomite value and miscellaneous stone from State total to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes pipe bedding and roofing granules.

[4]Includes poultry grit and mineral food.

[5]Withheld to avoid disclosing company proprietary data; included in "Total."

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
IOWA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	215	30,300	$168,000	$5.54	228	36,600	$211,000	$5.76
Dolomite	1	W	W	4.65	2	33	(3)	(3)
Miscellaneous stone	5	W	W	3.09	(4)	(4)	(4)	(4)
Total	XX	30,500	169,000	5.53	XX	36,600	211,000	5.75

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes limestone-dolomite, reported with no distinction between the two.
[3]Excludes dolomite value from State total to avoid disclosing company proprietary data.
[4]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

TABLE 4
IOWA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	39	(4)	131	687	W	W
Coarse aggregate, graded[5]	27	(4)	563	3,410	W	W
Fine aggregate (-3/8 inch)[6]	6	(4)	69	306	16	W
Coarse and fine aggregate[7]	(4)	(4)	1,680	8,320	543	3,190
Agricultural[8]	(4)	(4)	(4)	(4)	342	(4)
Chemical and metallurgical[9]	—	—	(4)	(4)	—	—
Special[10]	—	—	—	—	—	—
Unspecified:[11]						
Actual	(4)	(4)	1,320	7,820	3,980	(4)
Estimated	—	—	1,820	9,490	—	—
Total	943	6,180	7,480	49,800	4,880	34,200

	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	173	1,040	23	(4)	W	1,330
Coarse aggregate, graded[5]	1,290	7,940	9	(4)	881	W
Fine aggregate (-3/8 inch)[6]	140	532	(4)	(4)	28	W
Coarse and fine aggregate[7]	1,710	8,630	(4)	(4)	2,170	17,100
Agricultural[8]	264	1,850	18	(4)	381	1,960
Chemical and metallurgical[9]	(4)	(4)	—	—	—	—
Special[10]	(4)	(4)	—	—	(4)	(4)
Unspecified:[11]						
Actual	1,650	5,730	583	(4)	(4)	(4)
Estimated	2,410	10,900	7,360	45,900	1,270	3,050
Total	9,400	41,600	8,130	51,000	5,800	28,000

W Withheld to avoid disclosing company proprietary data; included with "Coarse and fine aggregate."
[1]Excludes dolomite value and miscellaneous stone from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, pipe bedding, and roofing granules.
[8]Includes agricultural limestone, and poultry grit and mineral food.
[9]Includes cement manufacture, flux stone, glass manufacture, and lime manufacture.
[10]Includes asphalt fillers or extenders, and other fillers or extenders.
[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

IOWA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,240	$17,600	$4.16
Plaster and gunite sands	104	484	4.65
Concrete products (blocks, brick, pipe, decorative, etc.)	138	464	3.36
Asphaltic concrete aggregates and other bituminous mixtures	744	3,010	4.04
Road base and coverings[2]	3,080	8,060	2.62
Fill	1,850	6,220	3.36
Snow and ice control	197	697	3.54
Other[3]	48	376	7.83
Unspecified:[4]			
Actual	2,810	13,900	4.93
Estimated	2,130	7,420	3.49
Total or average	15,300	58,200	3.80

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes filtration, railroad ballast, and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

IOWA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

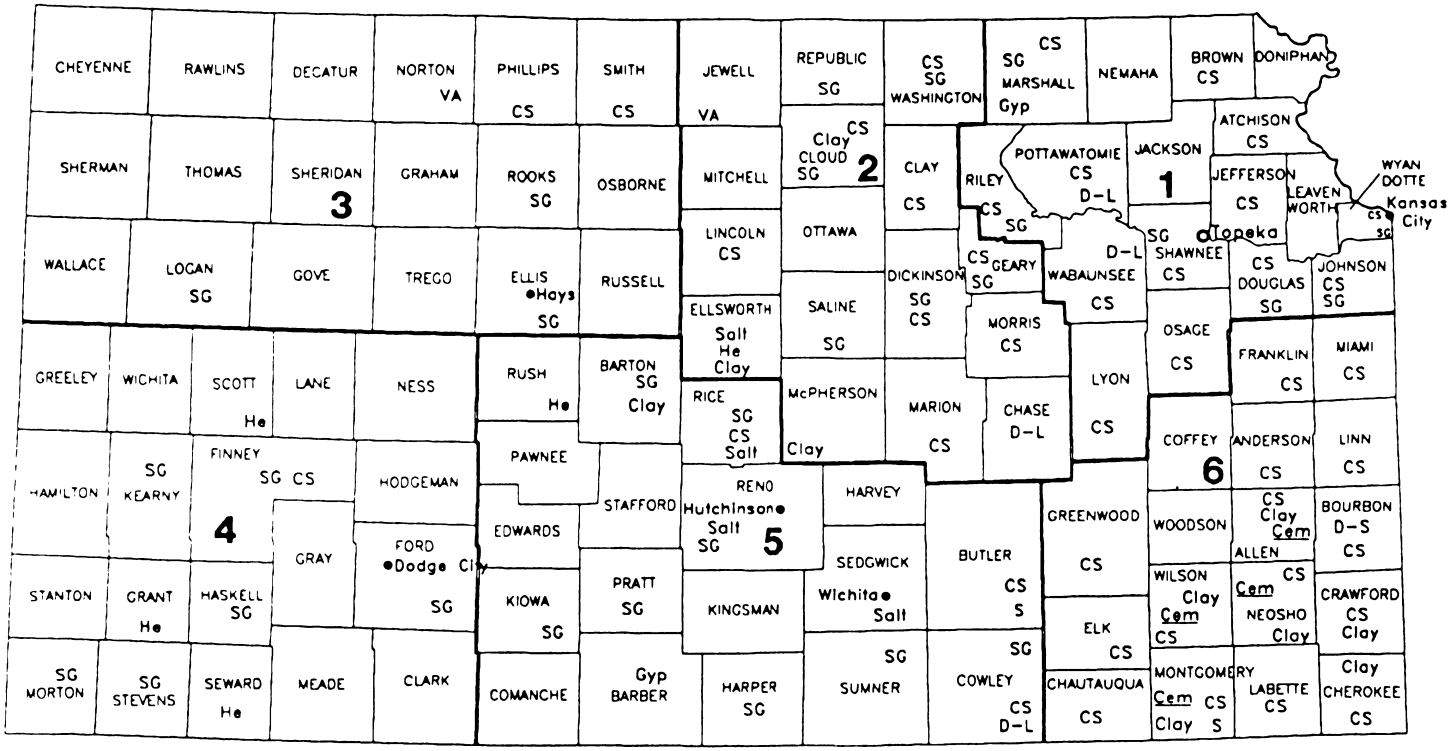
Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	676	2,240	691	2,820	1,520	6,430
Asphaltic concrete aggregates and road base materials[3]	1,470	4,130	1,050	2,520	2,200	7,560
Snow and ice control	57	126	42	150	66	271
Railroad ballast	1	3	—	—	—	—
Other miscellaneous uses[4]	4	34	17	205	4	24
Unspecified:[5]						
Actual	758	4,470	167	814	1,170	5,240
Estimated	1,360	4,450	49	195	606	2,310
Total	4,330	15,400	2,010	6,700	5,560	21,800
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	745	3,090	W	W	W	W
Asphaltic concrete aggregates and road base materials[3]	242	672	281	935	431	1,470
Snow and ice control	14	55	W	W	W	W
Railroad ballast	—	—	—	—	—	—
Other miscellaneous uses[4]	11	54	—	—	12	59
Unspecified:[5]						
Actual	378	1,580	50	202	295	1,560
Estimated	110	464	1	6	—	—
Total	1,500	5,920	459	1,650	1,480	6,680

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, and road and other stabilization (cement and lime).
[4]Includes filtration.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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KANSAS



LEGEND

- State boundary
- County boundary
- o Capital
- • City
- 1 —— Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-L	Dimension Limestone
D-S	Dimension Sandstone
Gyp	Gypsum
He	Helium
VA	Volcanic Ash
S	Sulfur
Salt	Salt
SG	Sand and Gravel

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF KANSAS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Kansas Geological Survey for collecting information on all nonfuel minerals.

Kansas remained 25th in 1995 among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $486 million, a 2% decrease from that of 1994. This followed a more than 12% increase from 1993 to 1994 (based on final data). The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

Grade-A helium and salt were Kansas' leading nonfuel mineral commodities accounting for 22% and 21%, respectively, of the State's total nonfuel mineral production value. Portland cement and crushed stone followed close behind with about 20% of the value each. In 1995, most of Kansas' decrease in nonfuel mineral value resulted from small drops in salt and crushed stone values. In contrast, in 1994, one-half of the year's $55 million increase in value (see table 1) was accounted for by a 36% increase in the value of portland cement. Nonfuel mineral values that increased from 1995 were as follows: grade-A helium, crude helium, crude gypsum, industrial sand and gravel, bentonite clays, and pumice and pumicite. Other nonfuel mineral commodities that decreased in value were: salt, portland cement, construction sand and gravel, masonry cement, common clays, dimension stone, and gemstones.

Production of nonfuel minerals in Kansas consisted entirely of industrial minerals; no metals were mined in the State. Based on USGS estimates of the quantities produced in 1995 in the 50 States, Kansas continued as the Nation's leading producer of crude and grade-A helium. The State remained fifth in salt production and sixth of the six pumice-producing States, while it increased from eighth to seventh in gypsum production. Significant quantities of portland cement, construction sand and gravel, common clays, and dimension stone also were produced in the State. Additionally, bentonite mining resumed in 1995.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN KANSAS[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	35,400	$2,410	24,000	$2,090	20,200	$1,760
Portland	do.	1,380,000	73,900	1,640,000	101,000	1,620,000	99,700
Clays	thousand metric tons	[3]513	[3]1,970	[3]556	[3]2,150	656	3,810
Helium:							
Crude	million cubic meters	23	20,400	32	31,400	33	32,700
Grade-A	do.	52	104,000	53	105,000	55	108,000
Salt	thousand metric tons	[4]2,320	[4]103,000	2,660	108,000	2,740	103,000
Sand and gravel (construction)	do.	[e]11,900	[e]30,700	11,200	29,600	10,400	28,000
Stone:							
Crushed	do.	[5]18,800	[5]90,700	21,500	103,000	20,000	97,000
Dimension[5]	metric tons	24,700	2,540	23,700	1,730	20,000	1,340
Combined value of clays [fuller's earth 1993-94)], gemstones, gypsum (crude), pumice and pumicite, salt [brine (1993)], sand and gravel (industrial), and stone [crushed sandstone (1993), dimension sandstone (1993-94)]		XX	12,600	XX	11,900	XX	10,400
Total		XX	442,000	XX	497,000	XX	486,000

[e]Estimated. [p]Preliminary. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" figure.
[4]Excludes salts in brines; value included with "Combined value" figure.
[5]Excludes certain stones; kind and value included with "Combined value" figure.

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The Kansas Geological Survey (KGS)[2] reported that most of the State's industrial minerals producers experienced a good year in 1995 as a result of a relatively strong State and National economy. Cement occasionally was in short supply as a result of fairly robust construction activity.

A request to dredge sand on the Kansas River between Lawrence and Topeka generated considerable discussion concerning the advantages and disadvantages to the communities along the river. Because the proposed site was near an old landfill, concern was expressed about possible river encroachment into the landfill area. Many environmental and recreation advocates opposed dredging on this portion of the river because of its relatively pristine condition and because it is host to the bald eagle. Other opponents claimed that such dredging causes accelerated erosion along the river banks.

Proponents of the dredging operation noted that the proposed site is near the Topeka-Kansas City metropolitan area, a populous region requiring large amounts of sand and gravel for construction. They think a properly planned operation would not affect bank erosion. River dredging is generally considered the most economical way to obtain sand because there is no overburden to strip. Additionally, there are negatives to dredging on the floodplain. It often removes productive farmland, leaves a pit that may require reclamation, and has a limited productive lifetime. Unlike a river, there is no recharge of readily usable material in floodplain deposits. These deposits commonly change in character and quality, making them uneconomical for sand production. These issues were brought before a State legislative committee.

Dredging permits and production limits along the lower Kansas River are currently determined by the U.S. Army Corps of Engineers to control the degree of river bed lowering and related damage to structures, such as pipelines. The production limits were established only a few years ago. The floods of 1993, along with increased flows from the reservoir system along the river's tributaries resulting from these floods were thought to affect recharge rates. At yearend 1995, the subject was still being debated, in part because of the difficulty in determining whether the Corps' limits are accurate in achieving a steady river bed level.

In other developments, Hunt-Midwest Corp., a crushed stone producer in Kansas and Missouri, acquired Killough Quarries, Inc., another long-time major crushed stone producer with operations in eastern Kansas. Hunt-Midwest will continue to operate the former Killough quarry operations except for Dunbar Trucking and Excavating Co., which was sold to Lawrence Ready-Mix Corp.

In 1994, the Kansas Legislature, for the first time, established procedures for mine permitting and reclamation. The Legislature named the State Conservation Commission as the organization responsible for implementing the new rules. Previous to this action, such matters were under the jurisdiction of the respective county governments. The Commission now maintains a list of all mineral operations in the State, except for river dredges and small operators whose combined operations are less than 0.8 hectares (2 acres).

The KGS released two recently completed maps; map M-39 shows the locations of active pits and quarries and map M-40 shows locations of abandoned pits and quarries in the State. Both are available through the Survey's Sales and Publications Division.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the KGS.

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TABLE 2

KANSAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	25	$113	$4.52
Riprap and jetty stone	146	1,110	7.58
Filter stone	369	1,970	5.34
Other coarse aggregate	W	W	6.18
Coarse aggregate, graded:			
Concrete aggregate, coarse	944	5,460	5.78
Bituminous aggregate, coarse	988	6,270	6.34
Bituminous surface-treatment aggregate	158	1,000	6.35
Railroad ballast	W	W	7.40
Other graded coarse aggregate	11	60	5.45
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	4.99
Stone sand, bituminous mix or seal	77	273	3.55
Screening, undesignated	310	1,220	3.95
Coarse and fine aggregate:			
Graded road base or subbase	1,570	6,890	4.39
Unpaved road surfacing	1,200	5,520	4.59
Crusher run or fill or waste	859	4,400	5.12
Other coarse and fine aggregate	153	1,020	6.65
Other construction materials[3]	547	3,220	5.88
Agricultural:			
Agricultural limestone	208	927	4.46
Other agricultural uses	1	4	4.00
Chemical and metallurgical: Cement manufacture	1,910	7,430	3.88
Unspecified:[4]			
Actual	7,110	31,700	4.46
Estimated	4,890	24,900	5.09
Total	21,500	103,000	4.82

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes limestone, limestone-dolomite, and sandstone and quartzite.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes drain fields, roofing granules, and waste material.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

KANSAS: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	127	r18,800	$90,700	$4.81	[2]113	[2]20,600	[2]$98,500	[2]$4.79
Sandstone and quartzite	(3)	(3)	(3)	(3)	3	919	4,920	5.4
Total	XX	18,800	90,700	4.81	XX	21,500	103,000	4.8

rRevised. XX Not applicable.
[1]Data are rounded to three significant digits.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.
[3]Excludes sandstone from State total to avoid disclosing company proprietary data.

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TABLE 4

KANSAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	238	1,550	140	747	—	—
Coarse aggregate, graded[4]	W	W	549	W	—	—
Fine aggregate (-3/8 inch)[5]	W	W	W	W	—	—
Coarse and fine aggregate[6]	1,350	7,140	W	W	123	212
Other construction materials[7]	795	5,200	1,010	8,330	—	—
Agricultural[8]	41	(9)	70	(9)	—	—
Chemical and metallurgical[10]	—	—	—	—	—	—
Unspecified:[11]						
Actual	3,440	(9)	1,740	(9)	—	—
Estimated	2,930	16,100	—	—	—	—
Total	8,790	48,600	3,520	15,600	123	212

	District 5		District 6	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	W	W	W	W
Coarse aggregate, graded[4]	—	—	826	W
Fine aggregate (-3/8 inch)[5]	W	W	W	W
Coarse and fine aggregate[6]	W	W	1,180	5,030
Other construction materials[7]	441	2,690	708	7,630
Agricultural[8]	(9)	(9)	(9)	(9)
Chemical and metallurgical[10]	—	—	1,910	7,430
Unspecified:[11]				
Actual	(9)	(9)	(9)	(9)
Estimated	—	—	1,960	8,710
Total	1,050	4,000	8,000	35,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]There was no crushed stone produced in District 4.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

[6]Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[7]Includes drain fields, roofing granules, and waste material.

[8]Includes agricultural limestone and other agricultural uses.

[9]Withheld to avoid disclosing company proprietary data; included in "Total."

[10]Includes cement manufacture.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

KANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	2,880	$8,070	$2.80
Plaster and gunite sands	170	408	2.40
Concrete products (blocks, brick, pipe, decorative, etc.)	154	609	3.95
Asphaltic concrete aggregates and other bituminous mixtures	1,710	5,620	3.28
Road base and coverings[2]	2,800	6,620	2.36
Fill	1,290	2,180	1.69
Snow and ice control	93	282	3.03
Other[3]	69	245	3.55
Unspecified:[4]			
Actual	684	1,800	2.63
Estimated	1,350	3,750	2.78
Total or average	11,200	29,600	2.64

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes filtration, railroad ballast, and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

KANSAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

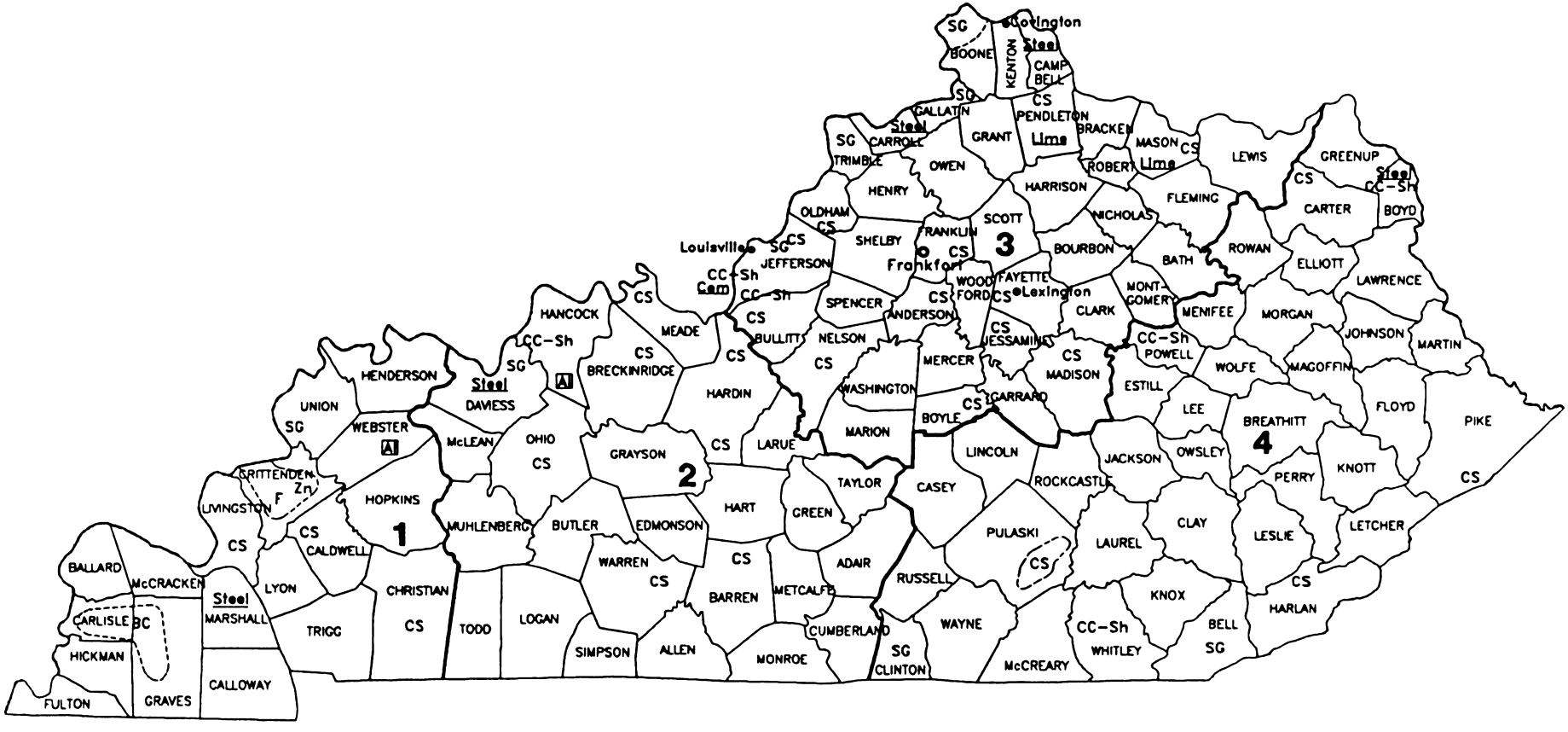
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	831	2,430	477	1,620	(3)	(3)
Asphaltic concrete aggregates and road base materials[4]	752	2,140	757	1,870	780	1,530
Other miscellaneous uses[6]	39	111	65	200	(3)	(3)
Unspecified:[7]						
Actual	156	296	4	46	1	3
Estimated	757	2,020	152	499	13	33
Total	2,540	7,000	1,460	4,240	850	1,760
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	(3)	(3)	1,490	3,910	—	—
Asphaltic concrete aggregates and road base materials[4]	1,400	4,070	2,060	4,650	[5]61	156
Other miscellaneous uses[6]	(3)	(3)	38	124	—	—
Unspecified:[7]						
Actual	6	13	516	1,440	—	—
Estimated	—	—	426	1,200	—	—
Total	1,760	5,120	4,530	11,300	[5]61	156

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes fill and road and other stabilization (cement and lime).
[5]Includes unspecified within all districts.
[6]Includes filtration, railroad ballast, roofing granules, and snow and ice control.
[7]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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KENTUCKY



LEGEND	
———	State boundary
———	County boundary
O	Capital
•	City
1 ———	Crushed stone/sand & gravel districts

MINERAL SYMBOLS			
A	Aluminum plant	Lime	Lime plant
BC	Ball clay	SG	Sand and Gravel
CC-Sh	Common Clay & Shale	Steel	Iron and Steel plant
Cem	Cement plant	Zn	Zinc
CS	Crushed Stone		Concentration of mineral operations
F	Fluorspar		

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF KENTUCKY

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Kentucky Geological Survey for collecting information on all nonfuel minerals.

Kentucky ranked 31st among the 50 States in 1995 in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). This is a drop from 28th place in 1994. The estimated value for 1995 was $401 million, a 6% decrease from that of 1994. This followed a 10.6% increase from 1993 to 1994 (based on final 1994 data). In 1995, Kentucky surpassed the $400 million mark for the third time in the last 4 years after having reached the highest nonfuel mineral value reported in the State's history in 1994. The State accounted for about 1% of the U.S. total nonfuel mineral production value.

The decrease in value in 1995 resulted mostly from the drop in crushed stone plus a smaller decrease in gemstones. A moderate increase in the value of lime somewhat mitigated the overall decrease. In 1995, crushed stone was the State's leading commodity, accounting for an estimated 57% of nonfuel mineral production value. Kentucky has been entirely an industrial mineral-producing State in recent years. The last year in which metals were mined in the State was 1990, when small quantities of zinc were mined. Compared with 1994, the value of lime increased. Decreases occurred in crushed stone, portland cement, construction sand and gravel, masonry cement, common clays, and gemstones.

Compared USGS estimates of the quantities produced in the other 49 States during 1995, Kentucky remained 3d in ball clays and one of the top six lime-producing States, whereas it dropped from 8th to 11th in the production of crushed stone. The State's mines and plants continued to produce significant quantities of construction sand and gravel, masonry cement, and common clays. Primary aluminum and raw steel were produced from materials obtained from other domestic and foreign sources. Kentucky remained the Nation's second leading producer of primary aluminum with an increase in production of more than 2% from that of 1994.

According to the Kentucky Geological Survey (KGS),[2] the main target for exploratory drilling in 1995 was mineralization in western Kentucky's fluorspar district. Orbex Resources, Inc. completed renovation of USX, Corp.'s mill in Salem, which is in the State's western district. In 1994, Orbex screened and dried fluorspar purchased from the National Defense Stockpile for resale. Silverspar Minerals Inc., Orbex's parent company, was seeking financing to purchase the Salem mine and mill properties from USX. No exploration activity was reported from the State's central and south-central mineral districts.

The Black River Division of Dravo Lime Co. completed most of the expansion of its Carntown lime plant in Pendleton County during 1995. The 630,000-metric-ton-per-year[3] (700,000-short-ton-per-year) expansion more than doubled existing production capacity. The project was undertaken in response to an increased demand for lime for flue gas

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN KENTUCKY[1 2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
Clays[3]	thousand metric tons	768	$3,060	820	$3,460	784	$2,590
Sand and gravel (construction)	do.	[e]7,700	[e]29,900	9,140	32,200	8,500	30,600
Stone (crushed)	do.	[4]49,000	[4]226,000	56,300	259,000	49,500	230,000
Combined value of cement, clays (ball), gemstones, lime, and stone (crushed sandstone (1993)		XX	128,000	XX	134,000	XX	137,000
Total		XX	388,000	XX	428,000	XX	401,000

[e]Estimated. [p]Preliminary. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.
[4]Excludes certain stones; kind and value included with "Combined value" data.

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desulfurization. Additionally, the company announced plans to add a new kiln and increase mine production at its Maysville Division Cabin Creek facility. As reported in the USGS annual lime plant directory, the Maysville Division facility was second in lime production in the United States in 1994 and the Black River operation ranked seventh.

The KGS reported that the Vulcan Materials Co. Reed quarry in western Kentucky continued to maintain its position in 1994 as the largest producer of crushed stone in the United States, based on a published trade journal report. Production that year was 9 million tons (10 million short tons). The Reed quarry ships about 80% of its production by barge and 10% each by rail and truck. The company's principal markets are in States in the lower Mississippi River Valley.

Gallatin Steel Co. began production at its minimill in Carroll County on the Ohio River. Annual capacity of the new plant was reported at 1.08 million tons (1.2 million short tons). Kentucky Electric Steel, Inc.'s project to increase the capacity of its Boyd County mill was in process.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document # 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the KGS.

[3]All tons are metric tons unless otherwise specified.

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TABLE 2

KENTUCKY: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	672	$2,680	$3.99
Riprap and jetty stone	4,110	17,100	4.15
Filter stone	1,060	4,980	4.71
Other coarse aggregate	849	3,280	3.86
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,410	16,600	4.86
Bituminous aggregate, coarse	4,420	22,600	5.11
Bituminous surface-treatment aggregate	1,690	8,740	5.18
Railroad ballast	599	2,760	4.61
Other graded coarse aggregate	1,250	4,120	3.28
Fine aggregate (-3/8 inch):			
Stone sand, concrete	388	2,090	5.37
Stone sand, bituminous mix or seal	1,950	9,310	4.77
Screening, undesignated	963	4,830	5.01
Other fine aggregate	W	W	3.87
Coarse and fine aggregate:			
Graded road base or subbase	7,970	36,000	4.52
Unpaved road surfacing	2,200	11,500	5.23
Terrazzo and exposed aggregate	W	W	4.96
Crusher run or fill or waste	2,640	10,600	4.00
Other coarse and fine aggregate	2,280	6,520	2.86
Other construction materials[3]	271	1,090	4.03
Agricultural:			
Agricultural limestone[4]	1,530	7,280	4.75
Other agricultural uses	2	25	12.50
Chemical and metallurgical[5]	3,920	15,900	4.07
Special:			
Mine dusting or acid water treatment	81	1,100	13.60
Other fillers or extenders	47	431	9.17
Unspecified:[6]			
Actual	10,400	50,700	4.90
Estimated	3,610	18,900	5.23
Total	56,300	259,000	4.61

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes limestone, limestone-dolomite, and sandstone.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes pipe bedding.

[4]Includes poultry grit and mineral food.

[5]Includes cement manufacture, lime manufacture, and sulfur oxide removal.

[6]Includes production reported without a breakdown by end use and estimates for norespondents.

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TABLE 3

KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS, BY KIND[1]

Kind	1993[2]				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	86	49,000	$226,000	$4.61	88	53,600	$246,000	$4.15
Granite	1	8	11	1.37	—	—	—	—
Total	XX	49,000	226,000	4.61	XX	[3]53,600	[3]259,000	[3]4.61

XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Excludes sandstone from State total to avoid disclosing company proprietary data.

[3]Includes "Limestone-dolomite," reported with no distinction between the two, and sandstone.

TABLE 4

KENTUCKY: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	W	W	325	1,430	W	W	1,130	5,640
Coarse aggregate, graded[3]	2,700	10,300	2,300	11,200	3,420	19,400	2,930	13,900
Fine aggregate (-3/8 inch)[4]	W	W	664	3,720	W	W	922	4,460
Coarse and fine aggregate[5]	5,140	16,900	2,520	11,400	4,620	22,700	2,820	13,700
Other construction materials[6]	5,730	—	6	33	1,470	7,520	2	4
Agricultural[7]	607	2,690	487	2,460	287	1,470	156	694
Chemical and metallurgical[8]	(9)	(9)	(9)	(9)	(9)	(9)	(9)	(9)
Special[10]	(9)	(9)	—	—	—	—	(9)	(9)
Unspecified:[11]								
Actual	—	—	(9)	(9)	(9)	(9)	1,220	5,930
Estimated	77	372	235	1,140	2,990	15,700	308	1,650
Total	15,100	56,800	10,700	49,400	20,800	106,000	9,630	46,600

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[6]Includes pipe bedding.

[7]Includes agricultural limestone, poultry grit and material food, and other agricultural uses.

[8]Includes cement manufacture, lime manufacture, and sulfur oxide removal.

[9]Withheld to avoid disclosing company proprietary data; included with "Total."

[10]Includes mine dusting or acid water treatment and other fillers or extenders.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

KENTUCKY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	1,410	$4,710	$3.33
Concrete products (blocks, brick, pipe, decorative, etc.)	93	377	4.05
Asphaltic concrete aggregates and other bituminous mixtures	519	1,570	3.03
Road base and coverings[2]	138	477	3.46
Fill	471	1,280	2.72
Unspecified:[3]			
Actual	5,960	21,300	3.57
Estimated	554	2,530	4.57
Total or average	9,140	32,200	3.52

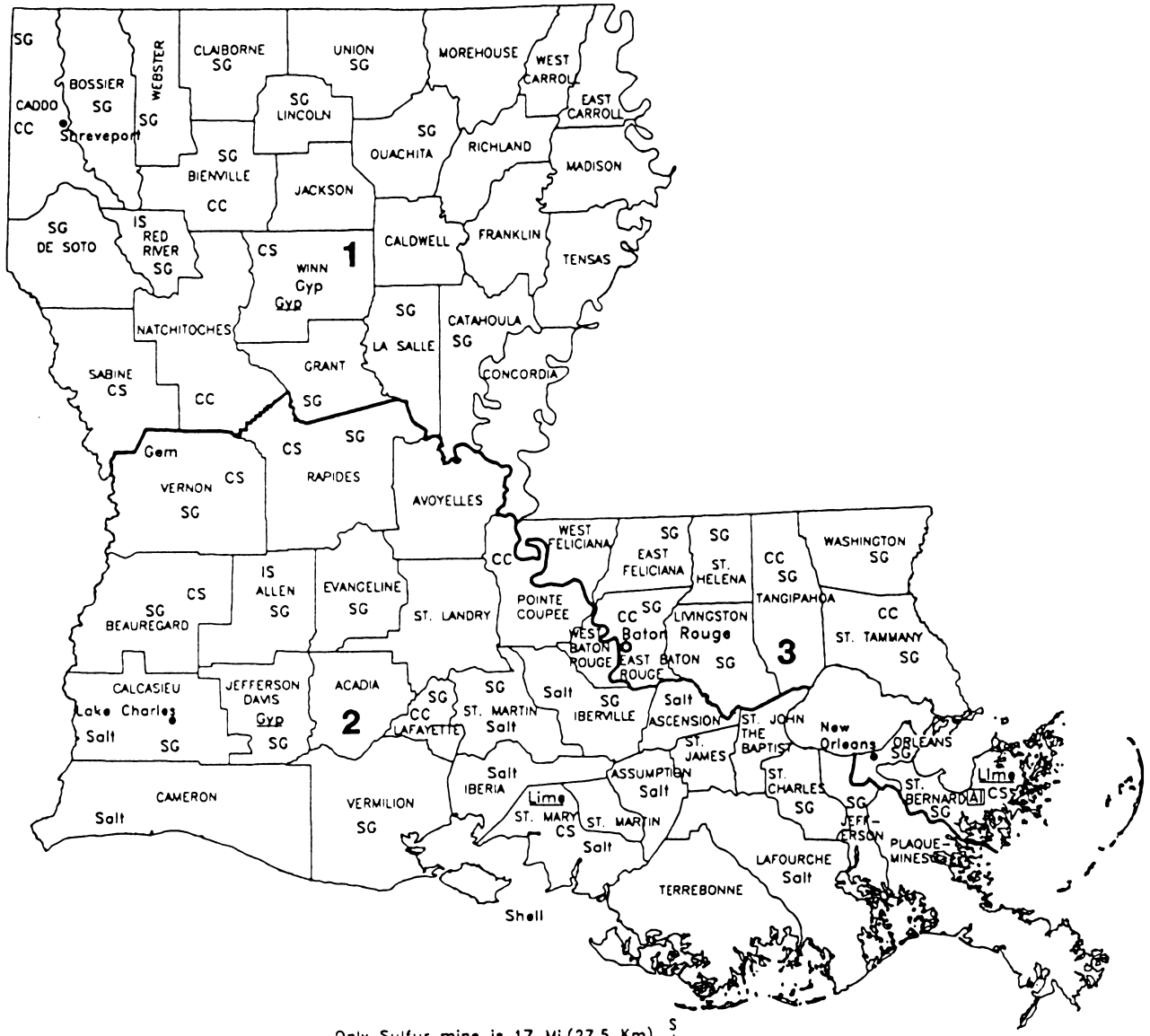
[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes snow and ice control.

[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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LOUISIANA



LEGEND

- State boundary
- County boundary
- o Capital
- • City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

- Al Aluminum plant
- CC Common Clay
- CS Crushed Stone
- Gem Gemstones
- Gyp Gypsum
- Gyp Gypsum plant
- IS Industrial Sand
- Lime Lime plant
- S Sulfur
- Salt Salt
- SG Sand and Gravel
- Shell Shell

0 50 Kilometers

Only Sulfur mine is 17 Mi.(27.5 Km) off shore in the Gulf of Mexico

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Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF LOUISIANA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Louisiana Geological Survey for collecting information on all nonfuel minerals.

In 1995, Louisiana climbed from 34th to 33d nationally in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $387 million, a more than 9% increase from that of 1994. This followed a 51% increase from 1993 to 1994 (based on final 1994 data). The State accounted for about 1% of the U.S. total nonfuel mineral production value.

Louisiana's leading nonfuel mineral is salt, accounting for about 41% of the State's nonfuel mineral value. When included as part of Louisiana's mineral production, sulfur is the State's second-leading nonfuel mineral commodity. All current sulfur production comes from a mine 27 kilometers (17 miles) off the Louisiana coast. Because of the mine's location, the State does not receive severance tax income or mineral production royalties; instead, they are collected by the Federal Government. Consequently, the State and the Louisiana Geological Survey (LGS) do not consider the sulfur production cited in table 1 as being part of Louisiana's nonfuel mineral production. This has been the case since 1991. The USGS attributes this offshore sulfur production to Louisiana because it is the State nearest to the sulfur mine and Freeport Sulphur Co., the company that operates the mine, is based in New Orleans. Compared with 1994, the mineral commodity values increased in 1995 for all commodities, including crushed stone when the withheld crushed shell and miscellaneous stone are included with the crushed stone total.

Based on USGS estimates of the quantities produced in the 50 States during 1995, Louisiana remained the leading State in the Nation in salt and sulfur production. Significant quantities of construction and industrial sand and gravel and common clays were produced in the State.

According to the LGS,[2] more than 148 mineral producers were mining in the State during 1995. Nonfuel mineral production came from 51 of the State's 64 parishes (counties). In addition, several minerals were imported or shipped into the State and processed into higher value products or used as plant feedstock to develop higher value materials. While the State claimed no sulfur production, byproduct sulfur was recovered from many petroleum and natural gas refineries.

The rock salt industry, which is composed of three

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN LOUISIANA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	375	r$3,320	371	$3,280	384	$3,400
Gemstones		NA	141	NA	155	NA	175
Salt	thousand metric tons	12,400	115,000	13,500	140,000	13,400	158,000
Sand and gravel:							
Construction	do.	e11,900	e51,500	12,300	49,600	13,200	55,400
Industrial	metric tons	465,000	9,360	454,000	9,320	454,000	9,320
Stone (crushed)	thousand metric tons	W	W	[3]707	[3]7,710	[3]600	[3]6,300
Sulfur (Frasch)	do.	740	W	W	W	W	W
Combined value of gypsum (crude), lime, stone [crushed limestone, shell and miscellaneous (1993), crushed shell and miscellaneous (1994-95)], and values indicated by symbol W		XX	54,600	XX	144,000	XX	155,000
Total		XX	r234,000	XX	354,000	XX	387,000

eEstimated. pPreliminary. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; values included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; kind and value included with "Combined value" data.

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companies, remained unchanged in 1995. Akzo Nobel Salt Inc. operated an underground mine on Avery Island, Morton International Inc. mined salt from an underground operation on Weeks Island, and North American Salt Co. operated an underground mine on Cote Blanche Island near Baldwin in St. Mary Parish. Cargill Salt Inc. produced vacuum pan salt from the mechanical evaporation of brine in St. Martin Parish.

Salt brine was produced in Ascension, Assumption, Calcasieu, Iberville, and Lafourche Parishes. While rock salt was produced in Iberia and St. Mary Parishes, Iberia Parish contributed nearly 63% of the State's total salt production. According to State severance tax data, Louisiana salt producers reported the production of 6.4 million tons[3] (7.1 million short tons) of rock salt and 10.2 million tons (11.2 million short tons) of brine, which may include brine as feedstock to make vacuum pan salt.

Aside from sulfur, construction sand and gravel continued to be the second major mineral commodity by value for the State and remained widespread, with 97 workable pits. Sand and gravel was produced in 41 parishes, with 5 parishes—St. Helena, Washington, St. Tammany, Jefferson, and Rapides—representing more than 51% of the State's total production. Sand and gravel sales generated severance taxes on 8.3 million tons (9.2 million short tons) of sand and 6.5 million tons (7.2 million short tons) of gravel from the State's producers.

Louisiana Industries Inc., a division of Dallas, TX-based Texas Industries, acquired Anderson-Dunham Inc.'s concrete pipe plant in Baton Rouge. In 1995, Louisiana Industries made 52,200 tons (58,000 short tons) of concrete pipe. The company added another 20,000 tons of production by acquiring the Anderson-Dunham plant.

During the year, six companies operated eight clay mines in seven parishes. Clay production was used in the manufacture of concrete blocks, common and face bricks, tiles, ceramics, and highway surfacing.

Sandstone, anhydrite, and shell were three minor mineral commodities in production. Two conventional surface mines produced 13,500 tons (14,900 short tons) of sandstone in Sabine and Vernon parishes. Winn Rock Inc. produced about 179,000 tons (197,280 short tons) of anhydrite from a quarry in Winn Parish. Severance tax figures indicated that 428,170 tons (471,970 short tons) of shell was dredged during fiscal year 1994, which was 202,630 tons (223,360 short tons) less than fiscal year 1993.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates as of Dec. 1995. Construction sand and gravel and crushed stone estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the LGS.

[3]All tons are metric tons unless otherwise specified.

TABLE 2

LOUISIANA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse and fine aggregates[3]	W	W	W
Unspecified: Estimated[4]	707	$7,710	$10.90
Total	707	7,710	10.90

W Withheld to avoid disclosing company proprietary data.

[1]Includes sandstone; excludes miscellaneous stone and shell from State total to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits.

[3]Includes graded roadbase or subbase and unpaved road surfacing.

[4]Includes coarse and fine aggregates and production reported without a breakdown by end use; includes estimates for nonrespondents.

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TABLE 3
LOUISIANA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Sandstone	1	W	W	W	6	[2]707	[2]$7,710	[2]$10.90
Shell	1	W	W	W	1	W	W	W
Miscellaneous stone	1	W	W	W	1	W	W	W
Total	XX	W	W	W	XX	707	7,710	10.90

W Withheld to avoid disclosing company proprietary data. XX Not applicable.
[1]Data are rounded to three significant digits.
[2]Includes shell and miscellaneous stone.

TABLE 4
LOUISIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)[2]	4,940	$21,300	$4.32
Asphaltic concrete aggregates and other bituminous mixtures	202	1,060	5.26
Road base and coverings[3]	350	1,870	5.34
Fill	1,270	2,140	1.68
Unspecified:[4]			
Actual	3,050	13,800	4.53
Estimated	2,480	9,330	3.76
Total or average	12,300	49,600	4.03

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5
LOUISIANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

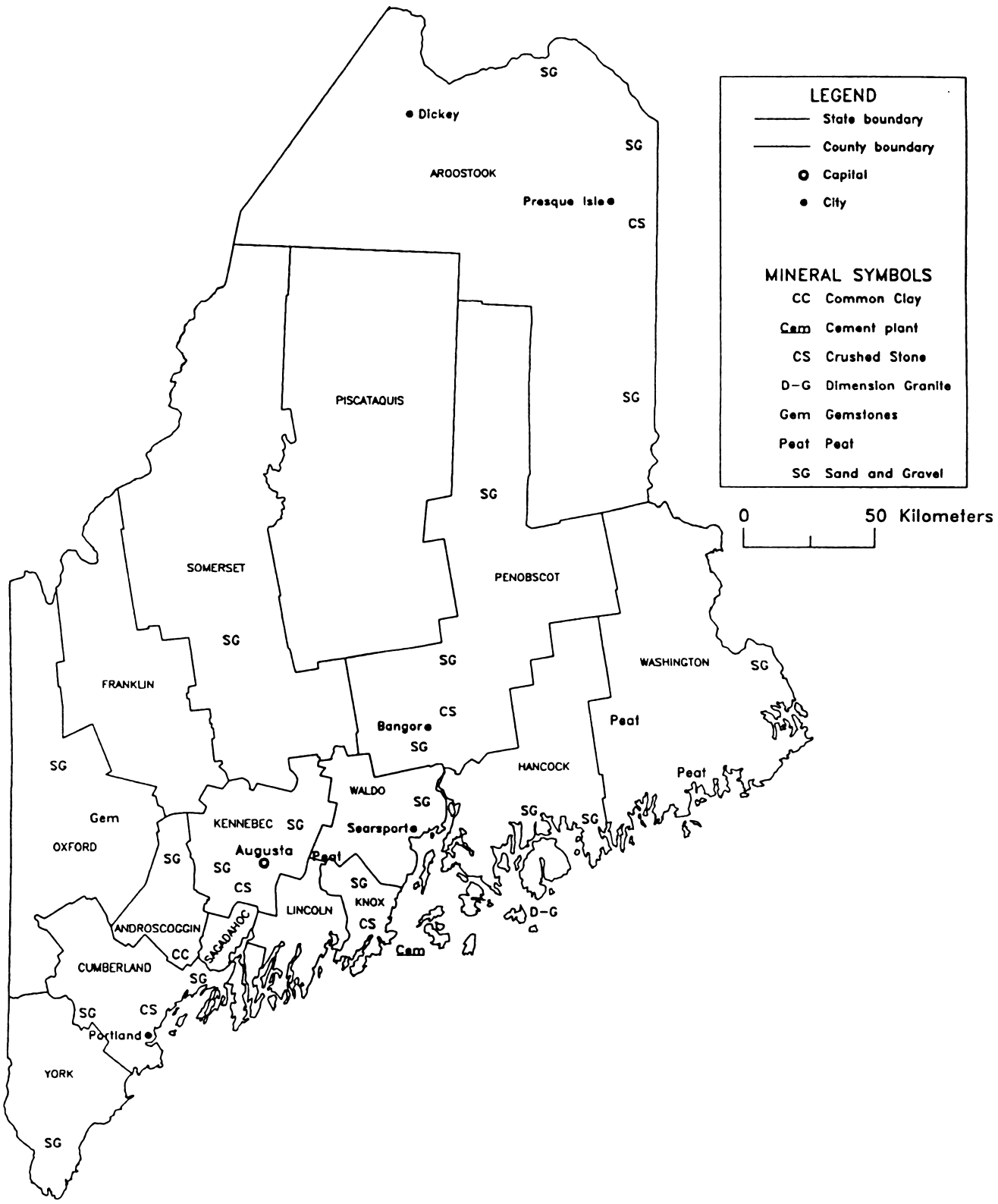
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	890	5,020	438	3,200	3,610	13,100
Asphaltic concrete aggregates and road base materials[3]	130	461	240	1,200	1,450	3,410
Unspecified:[4]						
Actual	40	98	1,050	5,950	1,960	7,780
Estimated	336	1,840	708	3,140	1,440	4,360
Total	1,400	7,410	2,440	13,500	8,460	28,700

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MAINE



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MAINE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Maine Geological Survey for collecting information on all nonfuel minerals.

In 1995, Maine ranked 46th in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $59 million, a 4% decrease from that of 1994. This followed a more than 1% increase from 1993 to 1994. The State accounted for somewhat less than 0.5% of the U.S. total nonfuel mineral production value. Compared with 1994, the values of crushed stone, dimension stone, and gemstones increased. Decreases occurred for construction sand and gravel and portland and masonry cements. Based on USGS estimates of quantities of minerals produced in the 50 States during 1995, Maine remained third in the production of peat.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data in Table 1 are estimates, as of Dec. 1995. Construction sand and gravel, crushed stone, and portland cement estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MAINE[1 2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
Gemstones		NA	$9,690	NA	$235	NA	$277
Sand and gravel (construction)	thousand metric tons	e4,400	e18,900	5,890	24,400	5,000	21,000
Stone (crushed)	do.	1,830	10,400	2,740	15,500	2,900	16,900
Combined value of cement, clays (common), peat, and stone (dimension)		XX	21,200	XX	20,900	XX	20,600
Total		XX	60,100	XX	61,000	XX	58,700

eEstimated. pPreliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.

TABLE 2
MAINE: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse and fine aggregate:			
Graded road base or subbase	198	$750	$3.79
Other construction materials[3]	706	4,110	5.83
Agricultural: Other agricultural uses	W	W	11.01
Chemical and metallurgical:			
Cement manufacture	W	W	4.74
Lime manufacture	W	W	4.74
Unspecified:[4]			
Actual	580	3,720	6.41
Estimated	642	3,970	6.18
Total	2,740	15,500	5.65

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Includes calcareous marl, granite, limestone, miscellaneous stone, slate, and traprock.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and stone sand (concrete).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
MAINE: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	6	1,430	$8,580	$6.02	6	1,530	$9,450	$6.19
Granite	2	W	W	3.95	3	314	1,420	4.52
Traprock	—	—	—	—	2	W	W	5.28
Slate	1	W	W	6.54	2	W	W	6.43
Calcareous marl	1	W	W	10.50	1	W	W	11.50
Miscellaneous stone	1	W	W	r1.31	2	198	750	3.79
Total	XX	1,830	10,400	5.65	XX	2,740	15,500	5.65

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

TABLE 4
MAINE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

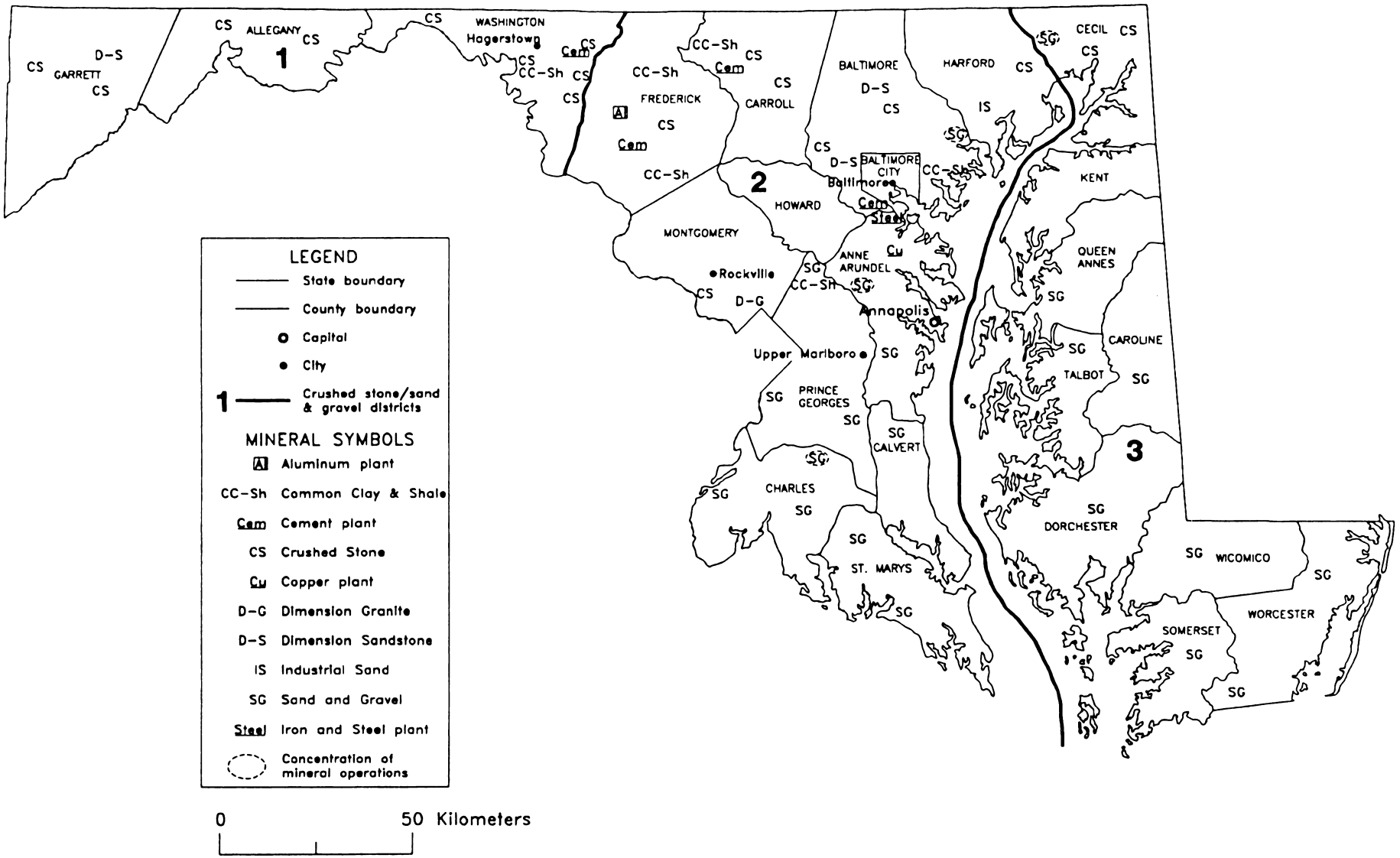
Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	582	$2,240	$3.85
Concrete products (blocks, brick, pipe, decorative, etc.)	(2)	2	6.19
Asphaltic concrete aggregates and other bituminous mixtures	1,680	9,490	5.64
Road base and coverings[3]	1,030	3,660	3.56
Fill	849	2,270	2.67
Snow and ice control	589	1,850	3.14
Railroad ballast	5	11	2.20
Unspecified:[4]			
Actual	421	1,560	3.71
Estimated	731	3,310	4.53
Total or average	5,890	24,400	4.14

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Less than 1/2 unit.
[3]Includes road and other stabilization (cement).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MARYLAND



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MARYLAND

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Maryland Geological Survey for collecting information on all nonfuel minerals.

Maryland ranked 35th among the 50 States in total nonfuel mineral production value,[1] up from 36th in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $341 million, a slight increase from that of 1994. This followed an 8.5% increase from 1993 to 1994 (based on final data). The State accounted for almost 1% of the U.S. total nonfuel mineral production value.

Crushed stone remained Maryland's leading nonfuel mineral commodity, accounting for nearly 50% of the State's nonfuel mineral value, followed by portland cement, 26%, and construction sand and gravel, 17%. In 1995, crushed stone was the only commodity with a significant increase in value. Compared with 1994, other mineral commodity values that increased in 1995 were dimension stone and industrial sand and gravel. Decreases occurred for construction sand and gravel and masonry and portland cements. In 1994, increases in masonry cement, crushed stone, and portland cement accounted for nearly all of the State's increase in nonfuel mineral value, mitigated somewhat by a moderate decrease in construction sand and gravel.

Compared with USGS estimates of the quantities produced in the other 49 States during 1995, Maryland was third in masonry cement, following a ranking of first in 1994. Additionally, the State produced significant quantities of crushed stone, portland cement, and dimension stone. All nonfuel minerals mined in Maryland were industrial minerals. All metals produced, in particular primary aluminum and raw steel, were processed from materials received from foreign and other domestic sources. Based on preliminary figures for both metals, Maryland was seventh in the Nation in the production of primary aluminum and one of the top eight raw steel-producing States.

The Maryland Department of the Environment (MDE)[2] reported that in 1995 Lehigh Portland Cement Co. applied for a permit to open a stone quarry on a 28-hectare (69-acre) site near Woodsboro in Frederick County. The company intended to mine the Cash-Smith shale to produce lightweight aggregate. Public hearings were held and permit issuance was likely during 1996.

Applications for mining permits from sand and gravel companies in 1995 remained constant with the past several years. The MDE anticipated new quarry applications to be submitted by Laurel Sand and Gravel, Inc. for a Howard County site and by the Arundel Corp. for a site in Carroll County.

The Sparrows Point Division of Bethlehem Steel Corp. shipped 3.2 million metric tons[3] of steel products during 1995, compared to 2.9 million tons in

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MARYLAND[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	1,630,000	$81,600	1,710,000	$90,700	1,680,000	$89,300
Clays	thousand metric tons	294	705	293	946	313	948
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	e11,200	e72,200	8,920	61,200	8,400	58,400
Stone:							
Crushed[3]	do.	r21,000	r139,000	24,100	162,000	24,800	169,000
Dimension	metric tons	19,300	2,020	18,800	1,550	23,600	1,950
Combined value of other industrial minerals		XX	r11,200	XX	r24,000	XX	21,800
Total		XX	r307,000	XX	r340,000	XX	341,000

e Estimated. p Preliminary. r Revised. NA Not available. XX Not applicable.

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2] Data are rounded to three significant digits; may not add to totals shown.

[3] Excludes certain stones; kind and value included with "Combined value" data.

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1994 and 2.8 million tons in 1993. Also during 1995, Sparrow Point's blast furnace L established a North American record of 305,000 tons of iron. Operating results improved during 1995 as a result of higher prices, increased facility utilization, and higher productivity. After decades of reduced operations and employee reductions, the Division hired about 200 new employees in 1995 from a pool of several thousand applicants.

The Governor of Maryland transferred responsibility for the regulation of mining, wetlands dam safety, and water appropriation to the MDE. This action was taken to allow a closer coordination with other related programs, such as the National Pollutant Discharge Elimination Systems (NPDES) permitting and the State's air quality control. NPDES activities are coordinated from within the MDE Division of Waste Management. Although the mining program still is located in Annapolis, the State Capitol, it eventually will be relocated to Baltimore.

The MDE has begun the process of developing zones of dewatering influence around limestone quarries in karst terrain in Baltimore, Washington, Frederick, and Carroll Counties. The zones are basedon topography, geologic and hydrogeologic factors, impacts to wells, and historical data. The Department has been seeking and obtaining information from quarry operators and the public in determining the zones. Quarry operators are responsible for any well failures and sinkhole damage in a zone unless they can prove that damage was caused by factors other than the quarry's operation.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the MDE.

[3]The conversion factor to change metric tons to short tons is 1.1023.

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TABLE 2

MARYLAND: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch), riprap and jetty stone[3]	1,130	$8,120	$7.16
Coarse aggregate, graded:			
Concrete aggregate, coarse	2,340	13,000	5.54
Bituminous aggregate, coarse	1,630	10,700	6.61
Bituminous surface-treatment aggregate	449	3,710	8.26
Railroad ballast	139	1,080	7.79
Other graded coarse aggregate	2,890	18,600	6.42
Fine aggregate (-3/8 inch):			
Stone sand, concrete	464	3,600	7.77
Stone sand, bituminous mix or seal	1,340	9,060	6.77
Screening, undesignated	325	1,790	5.50
Coarse and fine aggregates:			
Graded road base or subbase	3,680	21,600	5.88
Unpaved road surfacing	W	W	6.26
Terrazzo and exposed aggregate	W	W	7.62
Crusher run or fill or waste	2,440	17,800	7.30
Other coarse and fine aggregates	W	W	2.20
Other construction materials[4]	610	3,170	5.20
Agricultural: Agricultural limestone	(5)	(5)	7.51
Chemical and metallurgical: Cement manufacture	2,030	4,670	2.30
Special: Whiting or whiting substitute	(5)	(5)	92.60
Unspecified:[6]			
Actual	(5)	(5)	5.00
Estimated	1,030	7,160	6.93
Total	24,100	162,000	6.73

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes granite, limestone, sandstone, and traprock; excludes miscellaneous stone from State total to avoid disclosing company proprietary data.
[2]Data rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone.
[4]Includes roofing granules.
[5]Withheld to avoid disclosing company proprietary data; included in "Total."
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

MARYLAND: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	21	r16,100	r$109,000	r$6.78	20	16,900	$114,000	$6.77
Granite	4	4,800	28,600	5.97	4	4,940	31,600	6.40
Traprock	W	W	W	W	3	2,010	14,100	7.02
Sandstone	4	187	1,400	7.46	4	242	2,000	8.26
Miscellaneous stone	W	W	W	W	(2)	(2)	(2)	(2)
Total	XX	r21,000	r139,000	r6.60	XX	24,100	162,000	6.73

rRevised. W Withheld to avoid disclosing company proprietary data. XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

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TABLE 4

MARYLAND: CRUSHED STONE[1] [2] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[3]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[4]	W	W	W	W
Coarse aggregate, graded[5]	W	1,410	W	45,700
Fine aggregate (-3/8 inch) [6]	W	W	W	W
Coarse and fine aggregate[7]	676	2,770	6,000	39,000
Other construction materials	348	1,170	10,400	22,100
Agricultural[8]	—	—	(9)	(9)
Chemical and metallurgical[10]	(9)	(9)	(9)	(9)
Special[11]	—	—	(9)	(9)
Unspecified:[12]				
Actual	(9)	(9)	(9)	(9)
Estimated	4	21	1,040	7,220
Total	3,010	14,600	21,000	147,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.
[2]Production reported in District 3 was included with "District 2" to avoid disclosing company proprietary data.
[3]Data are rounded to three significant digits; may not add to totals shown.
[4]Includes filter stone and riprap and jetty stone.
[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).
[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates, and roofing granules.
[8]Includes agricultural limestone.
[9]Withheld to avoid disclosing company proprietary data; included in "Total."
[10]Includes cement manufacture.
[11]Includes whiting or whiting substitute.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

MARYLAND: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,700	$31,200	$6.64
Plaster and gunite sands	174	1,300	7.45
Concrete products (blocks, brick, pipe, decorative, etc.)	6	46	7.67
Asphaltic concrete aggregates and other bituminous mixtures	474	2,960	6.24
Road base and coverings[2]	684	5,980	8.74
Fill	271	670	2.47
Other[3]	51	194	3.80
Unspecified:[4]			
Actual	1,590	12,400	7.80
Estimated	961	6,410	6.67
Total or average	8,920	61,200	6.86

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes filtration and snow and ice control.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

MARYLAND: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

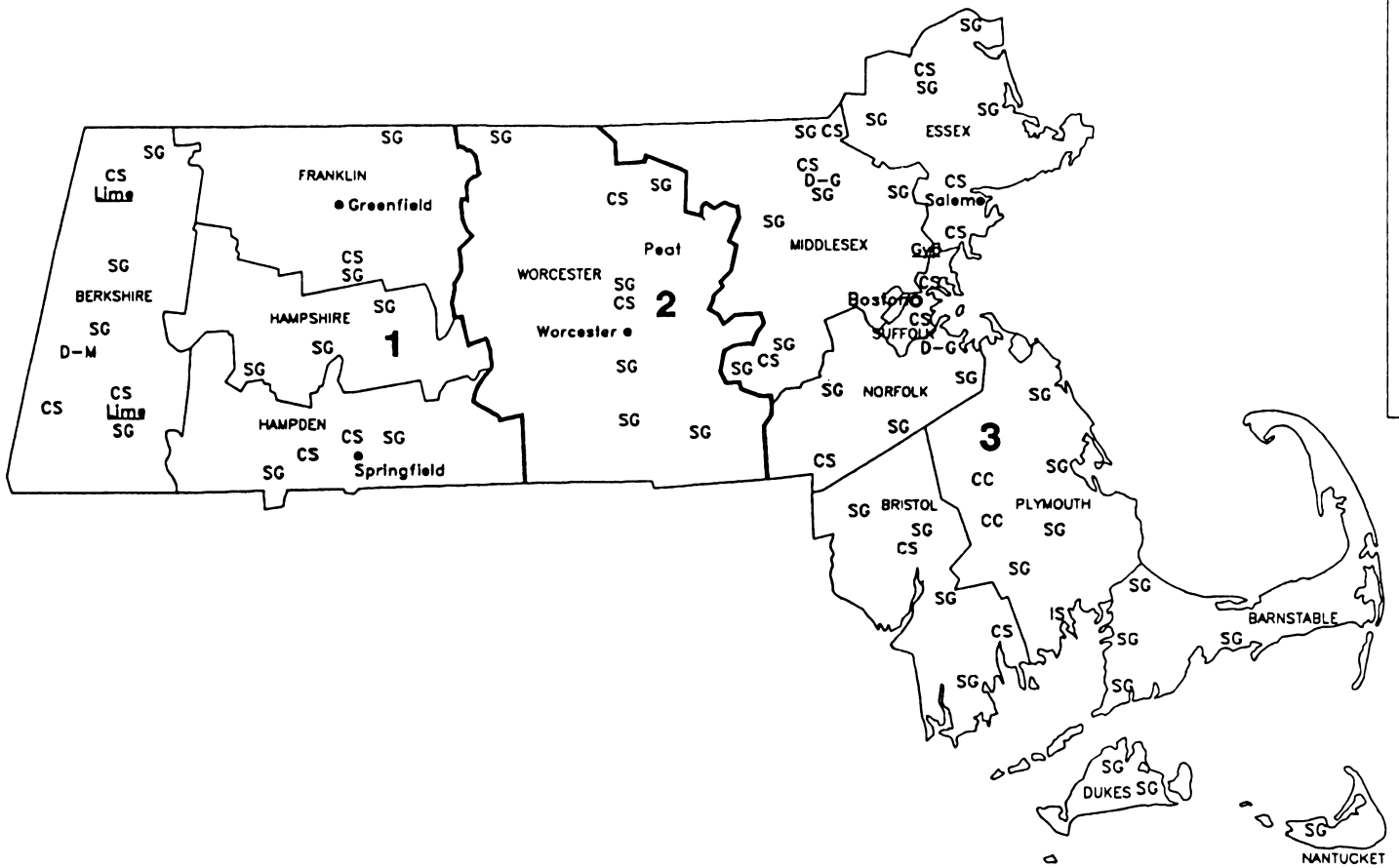
(Thousand metric tons and thousand dollars)

Use	District 2		District 3	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	4,260	28,900	622	3,680
Asphaltic concrete aggregates and road base materials[4]	1,150	9,010	285	594
Other miscellaneous uses[5]	35	94	15	100
Unspecified:[6]				
Actual	1,590	12,400	—	—
Estimated	21	110	940	6,300
Total	7,060	50,500	1,860	10,700

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill and road and other stabilization (lime).
[5]Includes filtration and snow and ice control.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MASSACHUSETTS



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

- CC Common Clay
- CS Crushed Stone
- D-G Dimension Granite
- D-M Dimension Marble
- Gyp Gypsum plant
- IS Industrial Sand
- Lime Lime plant
- Peat Peat
- SG Sand and Gravel

0 20 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MASSACHUSETTS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Commonwealth of Massachusetts, Executive Office of Environmental Affairs, for collecting information on all nonfuel minerals.

Massachusetts ranked 39th in the Nation in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $213 million, nearly a 20% increase from that of 1994. This followed a 10.8% increase from 1993 to 1994 (based on final data). The State accounted for about 0.5% of the total U.S. nonfuel mineral production value. The leading and second-leading mineral commodities in Massachusetts were crushed stone and construction sand and gravel, respectively. The crushed stone industry provided the State with most of the increased mineral value during 1994 and 1995. In 1995, crushed stone value increased 31%, or more than $30 million, from that of 1994. This followed crushed stone's nearly 28% gain of $21 million from 1993 to 1994. In 1995, the combined increases of crushed stone and dimension stone values were moderated somewhat by the decrease in construction sand and gravel. In 1994, while crushed stone and construction sand and gravel values increased, the State's increase overall was lessened by a substantial drop in dimension stone. Based on USGS estimates of quantities of dimension stone produced in the United States during 1995, Massachusetts increased in rank from sixth to fifth.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production nmay be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for construction sand and gravel and crushed stone are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MASSACHUSETTS[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Sand and gravel:							
Construction	thousand metric tons	[e]10,800	[e]$51,300	12,300	$60,000	10,500	$52,000
Industrial	metric tons	2,000	42	W	W	W	W
Stone:							
Crushed	thousand metric tons	[3]9,460	[3]76,300	10,500	97,300	13,500	128,000
Dimension	metric tons	153,000	21,300	57,300	9,600	W	W
Combined value of clays (common), gemstones, lime, peat, stone [crushed dolomite and miscellaneous (1993)], and values indicated by symbol W		XX	11,300	XX	10,600	XX	32,900
Total		XX	160,000	XX	178,000	XX	213,000

[e]Estimated. [p]Preliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; kind and value included with "Combined value" data.

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TABLE 2

MASSACHUSETTS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	2,490	$14,200	$5.71
Plaster and gunite sands	53	433	8.17
Concrete products (blocks, brick, pipe, decorative, etc.)	79	586	7.42
Asphaltic concrete aggregates and other bituminous mixtures	230	1,490	6.48
Road base and coverings[2]	1,600	8,250	5.16
Fill	2,110	6,560	3.11
Snow and ice control	484	2,210	4.57
Roofing granules	6	146	24.30
Other[3]	98	1,090	11.10
Unspecified:[4]			
Actual	1,070	4,510	4.21
Estimated	4,050	20,600	5.08
Total or average	12,300	60,000	4.89

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime).
[3]Includes filtration and railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

MASSACHUSETTS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

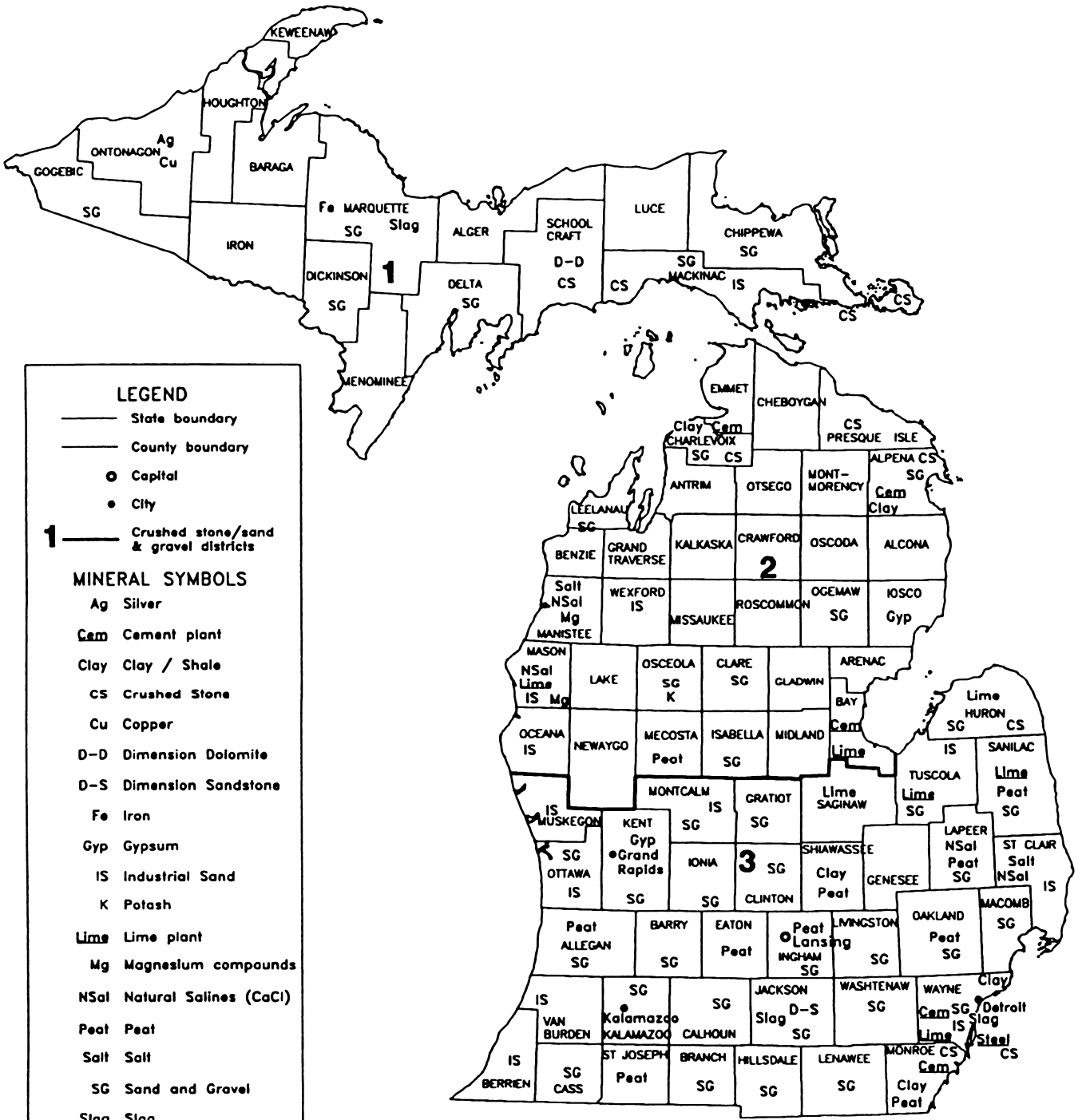
Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	401	1,990	741	4,340	1,480	8,880
Asphaltic concrete aggregates and road base materials[3]	511	2,590	1,250	4,530	2,180	9,180
Other miscellaneous uses[4]	42	222	301	1,290	246	1,930
Unspecified:[5]						
Actual	118	529	377	1,670	577	2,310
Estimated	637	3,220	247	1,660	3,160	15,700
Total	1,710	8,550	2,920	13,500	7,650	38,000

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, and road and other stabilization (lime).
[4]Includes filtration, railroad ballast, roofing granules, and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MICHIGAN



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Cem	Cement plant
Clay	Clay / Shale
CS	Crushed Stone
Cu	Copper
D-D	Dimension Dolomite
D-S	Dimension Sandstone
Fe	Iron
Gyp	Gypsum
IS	Industrial Sand
K	Potash
Lime	Lime plant
Mg	Magnesium compounds
NSal	Natural Salines (CaCl)
Peat	Peat
Salt	Salt
SG	Sand and Gravel
Slag	Slag
Steel	Iron and Steel plant

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MICHIGAN

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Geological Survey Division, Michigan Department of Natural Resources, for collecting information on all nonfuel minerals.

Michigan ranked eighth in the Nation in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State was seventh in 1994 (based on final data). The estimated value for 1995 was a little less than $1.5 billion, being virtually unchanged from that of 1994. This followed a 2.1% decrease in 1994 from that of 1993. The State accounted for nearly 4% of the U.S. total nonfuel mineral production value.

Michigan continued to be a major iron ore-producing State, second only to its neighboring State of Minnesota. Iron ore was the State's leading commodity by value, followed by portland cement. Michigan's iron ore production increased in 1995, but its value of mine shipments was slightly lower than in 1994. Significant increases in crushed stone and construction sand and gravel values, 14% and 25% respectively, were essentially offset by the combined 12% decrease in the value of portland cement and moderate decreases in the values of magnesium compounds, salt, and copper. Compared with 1994, other mineral commodities that increased in value in 1995 were as follows: masonry cement, silver, potash, and common clays. Decreases occurred in the values of industrial sand and gravel, crude gypsum, and dimension stone.

Compared with USGS estimates of the quantities produced in the other 49 States in 1995, Michigan remained first in magnesium compounds and iron oxide pigments; second in iron ore, industrial sand and

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MICHIGAN[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	216,000	$17,400	235,000	$17,700	238,000	$17,900
Portland	do.	5,120,000	313,000	5,160,000	331,000	4,560,000	293,000
Clays	thousand metric tons	1,230	4,850	1,150	3,370	605	3,560
Gemstones		NA	1	NA	2	NA	2
Gypsum (crude)	thousand metric tons	1,690	14,200	1,790	15,300	1,720	15,200
Iron ore (usable)	do.	12,900	W	13,800	W	W	W
Lime	do.	617	30,100	637	33,000	635	33,000
Peat	metric tons	186,000	6,110	156,000	5,090	[3]187,000	[3]6,570
Sand and gravel:							
Construction	thousand metric tons	[e]45,000	[e]158,000	48,800	160,000	53,000	183,000
Industrial	metric tons	2,570,000	25,100	2,870,000	31,300	3,020,000	29,800
Stone:							
Crushed	thousand metric tons	31,000	112,000	35,000	113,000	40,800	141,000
Dimension	metric tons	W	W	[4]147	[4]35	W	W
Combined values of bromne (1994-95) copper, iron oxide pigments (crude), magnesium compounds, potash, salt, silver, stone [(dimension (1993, 1995), dimension sandstone (1994)], and values indicated by symbol W		XX	823,000	XX	[r]761,000	XX	743,000
Total		XX	1,500,000	XX	[r]1,470,000	XX	1,470,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Data series changed to production beginning in 1995, prior years' shipment data may not be comparable.

[4]Excludes certain stones; kind and value included with "Combined value" data.

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gravel, and bromine; third in construction sand and gravel; fourth in portland cement, crude gypsum, and potash; and eighth in silver. While climbing from 7th to 5th in masonry cement and 10th to 9th in salt, the State dropped from 5th to 6th in copper production. Michigan was first in peat production, having ranked second in 1994 when peat data were tabulated by sales rather than production.

The Michigan Department of Natural Resources (DNR) was split into two agencies on October 1, according to DNR's Real Estate Division[2] (RED). Environmental, regulatory, and permitting functions were moved into the new Department of Environmental Quality (DEQ), while the traditional land use and conservation functions were retained by the DNR. Most of the Geological Survey Division (GSD) programs and staff are now part of the DEQ, while the RED was retained by DNR. The geologic activities left in the DNR are related to metallic, nonmetallic, and groundwater resources.

The GSD continued to operate the Geological Core and Sample Repository at Marquette. At the end of 1995, there were more than 21,815 containers of material from 1,776 drill holes, representing nearly 194 miles of drilling, and more than 221 containers of outcrop samples and other materials from 63 counties. The State Mine Map and Record Collection is also maintained by the GSD at Marquette. In 1995, GSD reported that five companies drilled 46 mineral exploration and development holes. These holes totaled 63,854 feet of drilling.

State metallic and nonmetallic mineral lease activity consisted of continued stone production on one lease and approval of exploration plans for three other leases. Mineral leasing is managed by the RED, which began reviewing the metallic mineral lease program to simplify and speed up lease processing, and to reduce administrative costs. The sand and gravel and aggregate permit process is currently being evaluated.

One hundred six State-owned DNR pits, managed by its Forest Management Division, were used by local governments and private contractors in 1995. During fiscal year 1994-95, 142 permits were issued for production in 31 counties. About 872,000 cubic yards of sand, gravel, rock, clay, limestone, and decorative stones were produced yielding $346,000 in royalties to the State.

The Abandoned Underground Mine Inventory contract was awarded to the Mineral Technology Research Group, Department of Mining Engineering, Michigan Technological University, Houghton. The 2-year State-funded contract is administered by the DNR/RED. Cooperation from others will be solicited in this effort to delineate potentially hazardous mine areas. Sites having historical, recreational, and economic potential also will be inventoried.

In industry developments, Inmet Mining Corp., of Canada, formerly Metall Mining Corp., closed most of their Copper Range Co., mine operations at White Pine in September. The smelter was closed earlier. About 1,000 employees were laid off. Solution mining is being attempted on an experimental basis. Permitting for large-scale solution mining is in process. The electrolytic refinery continued to refine copper anodes from Canada.

The Caledonia Mine, in Ontonagon County, was mined for native copper, silver, and other mineral collector specimens, and used as a special learning location by Red Metal Minerals, headquartered in Hubbell.

Keweenaw Copper Co., subsidiary of Great Lakes Minerals Inc., received the permits to open a copper mine near Gratiot Lake, Keweenaw County. A processor and a partner were being sought.

The Empire Mine, operated by Cleveland Cliffs Iron Co. (CCI), established a new record for shipping iron ore pellets by railroad, to Geneva, UT some 2,800 miles. CCI operated both the Empire and Tilden Mines and produced several grades of plain and fluxed pellets. Mine tailings were shipped from CCI's idle Republic Mine to LaFarge Corp., Alpena, MI to replace shale in cement manufacturing. All three mines were in Marquette County. Specialty Minerals Inc., the Michigan Limestone Association, Presque Isle Corp., and Osborne Materials Co., all shipped dolomite and limestone to CCI's Empire and Tilden iron ore mines for fluxed pellet production.

Crystal Exploration, Inc., Crystal Falls, MI, and joint venture partner, Ashton Mining of Canada Inc., announced finding several more kimberlite locations in their search for diamonds. Late in 1995, Crystal Exploration, Inc., was bought by Pathfind Resources, Ltd., of Canada, from Crystal Mining NL, of Australia.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Real Estate Division of the Michigan Department of Natural Resources.

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TABLE 2

MICHIGAN: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	197	$1,360	$6.88
Filter stone	62	241	3.89
Other coarse aggregate	4	18	4.50
Coarse aggregate, graded:			
Concrete aggregate, coarse	5,800	18,400	3.17
Bituminous aggregate, coarse	1,930	7,420	3.85
Bituminous surface-treatment aggregate	102	574	5.63
Railroad ballast	79	374	4.73
Fine aggregate (-3/8 inch):			
Stone sand, concrete	3	8	2.67
Stone sand, bituminous mix or seal	464	882	1.90
Screening, undesignated	376	1,170	3.12
Coarse and fine aggregates:			
Graded road base or subbase	2,950	9,090	3.08
Unpaved road surfacing	1,060	5,260	4.96
Crusher run or fill or waste	70	199	2.84
Other coarse and fine aggregates[3]	2,020	5,310	2.63
Agricultural: Agricultural limestone[4]	242	1,250	5.16
Chemical and metallurgical:			
Cement manufacture	5,980	11,400	1.90
Lime manufacture	W	W	3.28
Flux stone	2,390	7,120	2.98
Other miscellaneous uses: Sugar refining	4	14	3.50
Unspecified:[5]			
Actual	W	W	4.41
Estimated	666	2,440	3.66
Total	35,000	113,000	3.23

W Withheld to avoid disclosing company proprietary data; included in "Total."

[1]Includes calcareous marl, dolomite, limestone, limestone-dolomite, miscellaneous stone, sandstone, and traprock.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes macadam and other graded coarse aggregate.

[4]Includes other agricultural uses.

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

MICHIGAN: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r23	r25,000	r$88,400	r$3.54	[2]24	[2]27,900	[2]$90,000	[2]$3.23
Dolomite	r5	r5,360	r21,900	r4.09	6	6,810	22,200	3.26
Sandstone	3	W	W	2.53	3	W	W	2.91
Traprock	3	W	W	1.52	1	19	43	2.26
Calcareous marl	1	W	W	1.40	2	W	W	3.58
Miscellaneous stone	1	W	W	1.33	1	W	W	1.40
Total	XX	31,000	112,000	3.60	XX	35,000	113,000	3.23

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4

MICHIGAN: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	W	W	W	W	234	1,450
Coarse aggregate, graded[3]	3,500	7,240	W	W	W	W
Fine aggregate (-3/8 inch)[4]	W	W	14	44	W	W
Coarse and fine aggregate[5]	135	W	1,760	W	2,260	9,740
Agricultural[6]	W	W	W	W	116	W
Chemical and metallurgical[7]	W	W	8,140	19,600	W	W
Other miscellaneous uses[8]	—	—	4	14	—	—
Unspecified:[9]						
Actual	—	—	W	W	W	W
Estimated	132	185	98	227	436	2,020
Total	9,150	22,400	18,800	57,900	7,100	32,700

W Withheld to avoid disclosing company proprietary data; included in "Total."

[1]Data are rounded to three significant digits.

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

[5]Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[6]Includes agricultural limestone and other agricultural uses.

[7]Includes cement manufacture and flux stone and lime manufacture.

[8]Includes sugar refining.

[9]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

MICHIGAN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,840	$29,800	$3.80
Plaster and gunite sands	50	210	4.20
Concrete products (blocks, brick, pipe, decorative, etc.)	597	2,600	4.35
Asphaltic concrete aggregates and other bituminous mixtures	6,140	20,300	3.31
Road base and coverings[2]	9,890	27,300	2.76
Fill	6,030	10,100	1.68
Snow and ice control	458	1,400	3.05
Filtration	121	555	4.59
Other[3]	175	842	4.81
Unspecified:[4]			
Actual	11,000	45,400	4.11
Estimated	6,440	21,400	3.33
Total or average	48,800	160,000	3.28

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes railroad ballast and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

MICHIGAN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

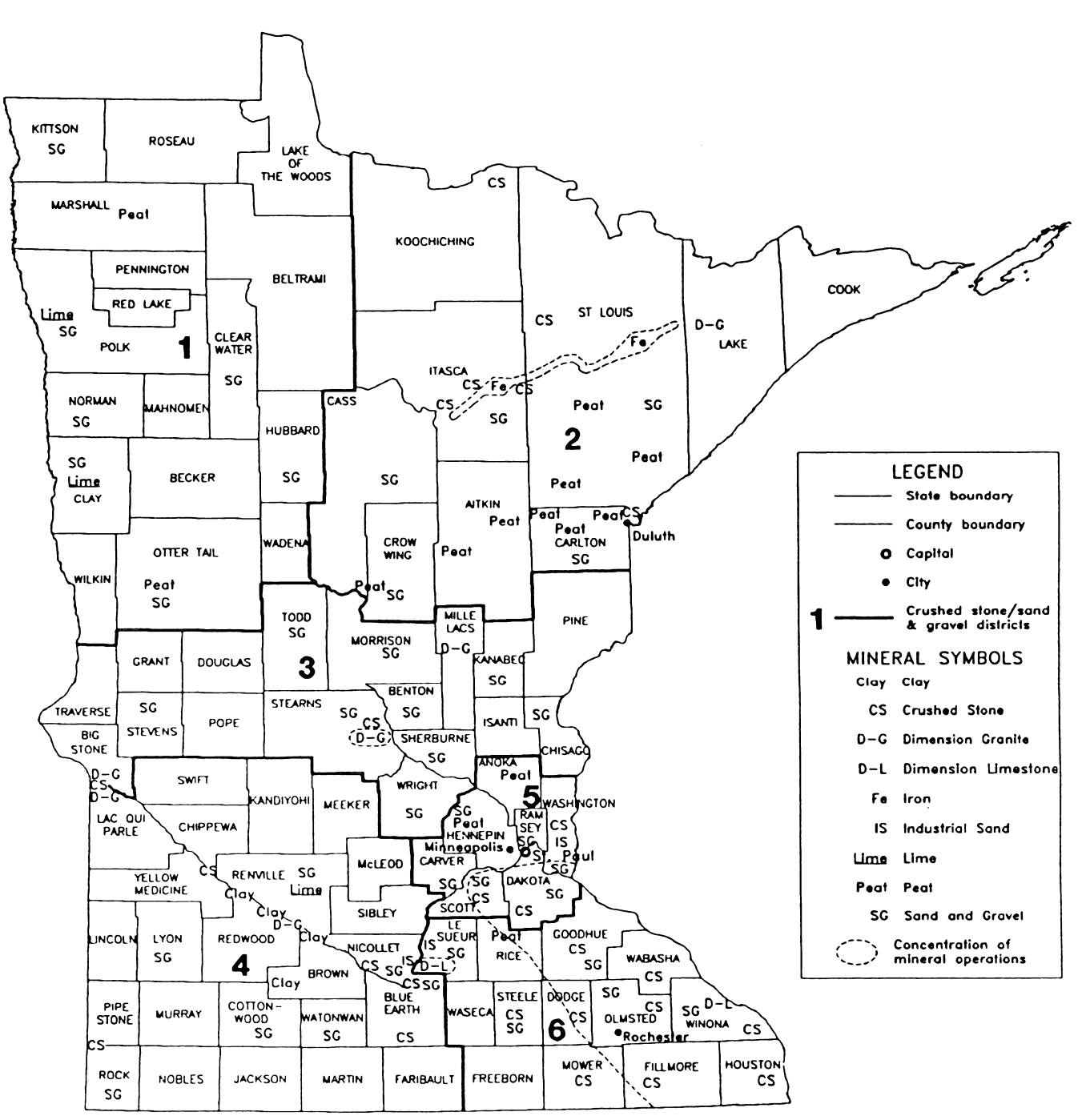
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	325	1,540	531	2,120	7,630	29,000
Asphaltic concrete aggregates and road base materials[3]	1,790	3,930	2,450	6,780	17,800	48,100
Snow and ice control	108	282	128	373	222	740
Other miscellaneous uses[4]	—	—	145	618	151	779
Unspecified:[5]						
Actual	15	119	176	631	10,800	44,600
Estimated	1,070	3,200	1,130	3,690	4,230	14,500
Total	3,310	9,070	4,570	14,200	40,900	137,000

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill and road and other stabilization (cement and lime).
[4]Includes filtration, railroad ballast, and roofing granules.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MINNESOTA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MINNESOTA

Minnesota climbed in rank from ninth to seventh among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State's change in rank was primarily the result of the increased sales of iron ore. The estimated value for 1995 was almost $1.5 billion, nearly a 4% increase from that of 1994. This followed a 3.3% increase from 1993 to 1994 (based on final data). The State accounted for nearly 4% of the U.S. total nonfuel mineral production value.

The changes in Minnesota's total nonfuel mineral value that occurred during 1992-95 resulted mostly from the combined effects of increased iron ore shipments, and less so, the production of construction sand and gravel and crushed stone. In 1995, iron ore accounted for nearly 86% of the State's nonfuel mineral value, while construction sand and gravel and crushed stone accounted for more than 7% and 3%, respectively. Throughout most of the years 1980-90, Minnesota ranked between second and sixth nationally in nonfuel mineral production value when iron ore prices and related sales were stronger than in the early 1990's. Other nonfuel mineral values that increased in 1995 were construction sand and gravel, crushed stone, dimension stone, and lime. Small decreases occurred in the values of industrial sand and gravel, peat, and kaolin clays.

Compared to USGS estimates of quantities produced in the other 49 States in 1995, Minnesota remained 1st in the Nation in iron ore, 8th in construction sand and gravel, and 10th in industrial sand and gravel. The State ranked fifth in the production of peat; in 1994, when ranking for peat was based on sales rather than quantity produced, Minnesota ranked third. Additionally, the State's quarries produced significant quantities of crushed stone and dimension stone.

According to the Minnesota Department of Natural Resources' Minerals Division (MDNR),[2] a cooperative environmental minewaste management resource study involving the mining industry and the MDNR was initiated on the in-pit disposal of taconite tailings and its potential impacts on ground water. Another cooperative environmental study on the hydrology of the Mesabi Iron Range will examine the rates at which abandoned pits fill with water and assess the ultimate water elevation in the pits. The latter study involves the mining industry, MDNR, and the Iron Range Resources and Rehabilitation Board, with initial funding provided by the U.S. Bureau of Mines.

In other State regulatory developments, nonferrous metal mine leasing rules were amended to establish a new preference rights leasing system. Under new rules that took effect on December 1, selected lands previously offered, but not bid upon, at a public lease sale may again be available for leasing upon approval of a new application. Separately, the State adopted new industrial mineral leasing rules covering such minerals as dimension stone, gemstones, kaolin, and silica sand. Industrial mineral leases primarily will be

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MINNESOTA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$65	NA	$26	NA	$26
Iron ore (usable)	thousand metric tons	42,500	1,130,000	43,300	1,160,000	46,600	1,280,000
Peat	metric tons	33,000	1,930	37,000	3,010	W	W
Sand and gravel (construction)	thousand metric tons	e30,500	e85,400	29,500	90,000	34,000	109,000
Stone:							
Crushed	do.	9,420	37,700	10,900	47,100	11,200	49,300
Dimension	metric tons	33,500	11,800	16,900	W	W	W
Combined value of clays (common, kaolin), lime, sand and gravel (industrial), and values indicated by symbol W		XX	35,500	XX	44,900	XX	51,000
Total		XX	1,300,000	XX	1,340,000	XX	1,490,000

eEstimated. pPreliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

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available through a negotiation process. The first industrial mineral lease issued under the new rules was granted to Cominco American Resources Inc. for diamond exploration at a 64-hectare (160-acre) site in Wilkin County.

The State held its 20th nonferrous metals lease sale on October 10. Leases were awarded to American Shield Co., By-Products Industries, Cominco American Inc., Milestone Joint Venture, North Bay Exploration, and Phelps Dodge Exploration East. These leases, comprising almost 4,400 hectares (11,000 acres), were in Aitkin, Beltrami, Carlton, Crow Wing, Itasca, Lake of the Woods, and St. Louis Counties. In other industry news, USX Corp. announced plans to extend its Minntac West Pit adjacent to the Midway Mine, near Kinney on the Mesabi Iron Range.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by MDNR.

TABLE 2

MINNESOTA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone[3]	251	$1,090	$4.34
Coarse aggregate, graded:			
Concrete aggregate, coarse	530	2,530	4.77
Bituminous aggregate, coarse	183	939	5.13
Bituminous surface-treatment aggregate	W	W	5.97
Railroad ballast	778	4,370	5.62
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	4.42
Stone sand, bituminous mix seal	204	1,070	5.25
Screening, undesignated	118	533	4.52
Coarse and fine aggregates:			
Graded road base or subbase	2,380	9,270	3.89
Unpaved road surfacing	274	935	3.41
Terrazzo and exposed aggregate	121	605	5.00
Crusher run or fill or waste	W	W	3.90
Other coarse and fine aggregates	W	W	5.80
Other construction materials	386	2,060	5.34
Agricultural limestone[4]	176	747	4.24
Special:			
Asphalt fillers or extenders	(5)	(5)	2.48
Other fillers or extenders	(5)	(5)	5.51
Unspecified:[6]			
Actual	(5)	(5)	4.35
Estimated	2,910	11,700	4.02
Total	10,900	47,100	4.32

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes dolomite, granite, limestone, sandstone and quartzite, and traprock.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone.

[4]Includes poultry grit and mineral food.

[5]Withheld to avoid disclosing company proprietary data; included in "Total."

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

MINNESOTA: CRUSHED STONE SOLD OR USED BY PRODUCERS BY KIND[1]

Kind	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r35	r7,150	r$26,900	r$3.77	49	7,670	$32,700	$4.26
Granite	3	W	W	4.00	4	W	W	4.64
Dolomite	5	W	W	3.50	4	W	W	3.02
Sandstone and quartzite	2	W	W	7.77	5	W	W	5.75
Traprock	2	W	W	4.29	2	W	W	4.29
Total	XX	9,420	37,700	4.00	XX	10,900	47,100	4.32

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

TABLE 4

MINNESOTA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY DISTRICT[2] AND USE

(Thousand metric tons and thousand dollars)

Use	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	57	400	(4)	(4)	(4)	(4)
Coarse aggregate, graded[5]	W	W	(4)	(4)	(4)	(4)
Fine aggregate (-3/8 inch)[6]	W	W	(4)	(4)	70	225
Coarse and fine aggregate[7]	W	W	(4)	(4)	331	1,200
Other construction materials	1,880	9,820	—	—	47	261
Agricultural[8]	(4)	(4)	(4)	(4)	24	111
Special[9]	—	—	(4)	(4)	—	—
Unspecified:[10]						
Actual	(4)	(4)	(4)	(4)	1,640	7,240
Estimated	1,140	4,500	974	$3,700	803	3,550
Total	3,510	16,900	4,260	16,600	3,120	13,600

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Production reported in District 2 and 3 was included with "District 4" to avoid disclosing company proprietary data; no crushed stone was produced in District 1.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone and riprap and jetty stone.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate and railroad ballast.
[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).
[7]Includes graded road base or subbase, unpaved road surfacing, terrazzo and exposed aggregate, crusher run (select material or fill), and other coarse and fine aggregates.
[8]Includes agricultural limestone, and poultry grit and mineral food.
[9]Includes asphalt fillers or extenders, and other fillers or extenders.
[10]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

MINNESOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	6,020	$22,300	$3.71
Plaster and gunite sands	164	966	5.89
Concrete products (blocks, brick, pipe, decorative, etc.)	666	2,680	4.02
Asphaltic concrete aggregates and other bituminous mixtures	3,410	13,400	3.92
Road base and coverings[2]	9,010	23,500	2.61
Fill	2,700	5,700	2.11
Snow and ice control	263	732	2.78
Roofing granules	39	356	9.13
Filtration	72	505	7.01
Other[3]	30	164	5.47
Unspecified:[4]			
Actual	3,010	8,560	2.84
Estimated	4,070	11,200	2.74
Total or average	29,500	90,000	3.06

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

MINNESOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

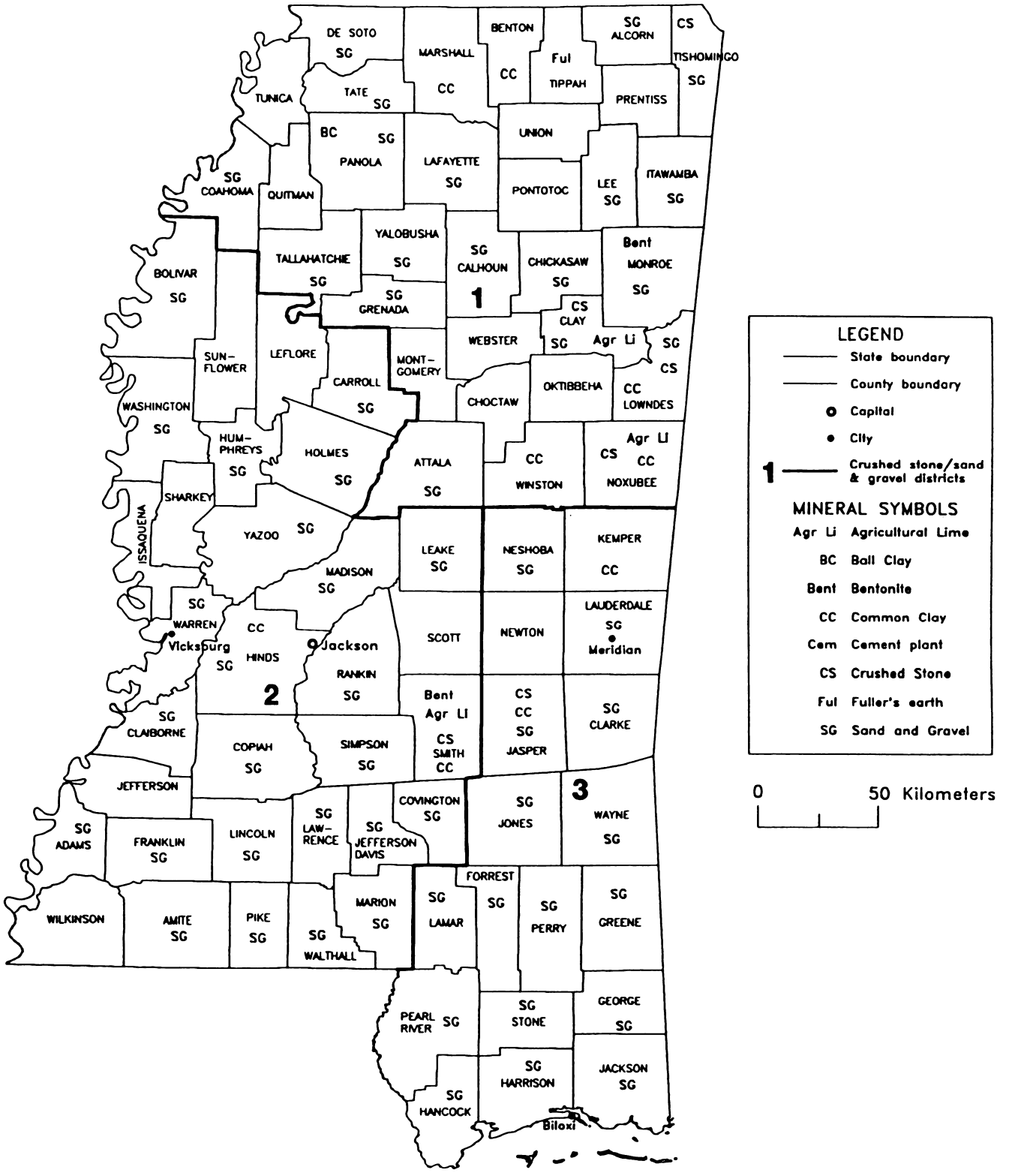
Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	693	3,470	637	2,730	1,260	4,880
Asphaltic—bituminous mixtures	618	2,180	W	W	1,630	4,870
Road base and coverings[3]	1,570	4,320	757	2,410	3,610	7,610
Fill	68	126	531	1,810	233	487
Snow and ice control	42	125	W	W	44	114
Other miscellaneous uses[4]	35	305	170	743	65	478
Unspecified:[5]						
Actual	188	377	268	612	181	501
Estimated	1,260	3,100	214	518	579	1,930
Total	4,470	14,000	2,580	8,830	7,600	20,900
	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	854	3,630	2,650	7,810	760	3,460
Asphaltic—bituminous mixtures	364	1,280	W	W	257	853
Road base and coverings[3]	1,770	5,490	739	1,890	575	1,780
Fill	254	545	1,390	2,330	229	395
Snow and ice control	13	47	W	W	92	245
Other miscellaneous uses[4]	25	119	462	3,780	—	—
Unspecified:[5]						
Actual	142	436	1,870	5,860	368	772
Estimated	544	1,510	1,240	3,320	234	810
Total	3,960	13,100	8,350	25,000	2,520	8,310

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Include road and other stabilization (cement and lime).
[4]Includes railroad ballast.

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MISSISSIPPI



Principal Mineral–Producing Localities

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THE MINERAL INDUSTRY OF MISSISSIPPI

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Office of Geology, Mississippi Department of Environmental Quality, for collecting information on all nonfuel minerals.

In 1995, Mississippi remained 42d among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $125 million, about a 7% decrease from that of 1994. A substantial portion of the State's nonfuel mineral data for 1993 was withheld to protect company proprietary information. Consequently, the true percent of increase or decrease in 1994 (represented in table 1), as is described in Mineral Industry Surveys for most other States, is not possible for Mississippi. In 1995, the State accounted for somewhat less than one-half percent of the U.S. total nonfuel mineral production value.

Construction sand and gravel was the State's leading nonfuel mineral, accounting for 38% of the State's nonfuel mineral production value. The State's clays included ball clays, bentonite, common clays, and fuller's earth. Fuller's earth was the State's second leading nonfuel mineral commodity, followed by portland cement. Compared with those of 1994, the values of crushed stone and bentonite increased, while those of construction sand and gravel, portland cement, fuller's earth, and common clays decreased.

Based on USGS estimates of the quantities produced in the 50 States during 1995, Mississippi climbed in rank from third to second in fuller's earth, fourth to third in bentonite, and dropped from third to fourth in ball clay production. Additionally, the State's mine pits produced significant quantities of construction sand and gravel and common clays. Metals produced in Mississippi, mostly that of raw steel, were processed from materials received from other domestic and foreign sources.

According to the Mississippi Office of Geology,[2] the mining industry had a fairly good 1995, while the State had one of the stronger economies in the Nation. Several major road construction projects continued to push the number of permits issued to record levels. Casinos continued to play a major part in the number of permits granted because of increased demand for construction and road-building material needed on the Gulf Coast and in certain counties along the Mississippi River. Bond release applications and, thus, the amount of reclaimed land, were also on the increase.

Discussions continued with Phillips Coal Co. regarding its impending application for a lignite mine in Choctaw County. The company's plans include construction of a mine-mouth, coal-fired generating plant producing 300 megawatts of electricity. The permit will eventually cover about 6,500 hectares (16,000 acres). The company hoped to begin plant construction by the end of the decade.

New mining laws took effect in Mississippi during 1995. The Office of Pollution Control promulgated new water quality regulations on mining in rivers and

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MISSISSIPPI[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	1,100	[3]$34,300	[3]1,190	[3]$40,500	[3]1,160	[3]$41,000
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	[e]14,500	[e]57,300	12,400	53,200	10,800	47,500
Stone (crushed)	do.	2,100	8,120	1,900	7,490	2,200	9,000
Combined value of other industrial minerals		XX	([4])	XX	33,900	XX	27,600
Total		XX	[5]99,800	XX	135,000	XX	125,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.
[4]Value excluded to avoid disclosing company proprietary data.
[5]Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

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streams ("in the wet") and mining on sandbars above the high-water line ("in the dry"). These new rules were approved after much input from the State's mining industry.

Personnel from the Office of Geology's Surface Mining and Reclamation Division were certified in November 1995 by the U.S. Mine Safety and Health Administration to offer refresher course training beginning in early 1996 to miners in qualified mining operations. Previously this training had been conducted by the State Department of Education.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most recent information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by Mississippi's Office of Geology.

TABLE 2
MISSISSIPPI: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5	2,100	$8,120	$3.87	4	1,870	$7,290	$3.90
Calcareous marl	—	—	—	—	3	26	203	7.81
Total	XX	2,100	8,120	3.87	XX	1,900	7,490	3.94

XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.

TABLE 3
MISSISSIPPI: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	5,100	$23,400	$4.58
Plaster and gunite sands	50	197	3.94
Concrete products (blocks, brick, pipe, decorative, etc.)	127	707	5.57
Asphaltic concrete aggregates and other bituminous mixtures	2,650	12,600	4.74
Road base and coverings[2]	1,260	4,790	3.80
Fill	1,150	2,430	2.12
Unspecified:[3]			
Actual	827	3,970	4.80
Estimated	1,220	5,150	4.21
Total or average	12,400	53,200	4.29

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 4

MISSISSIPPI: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

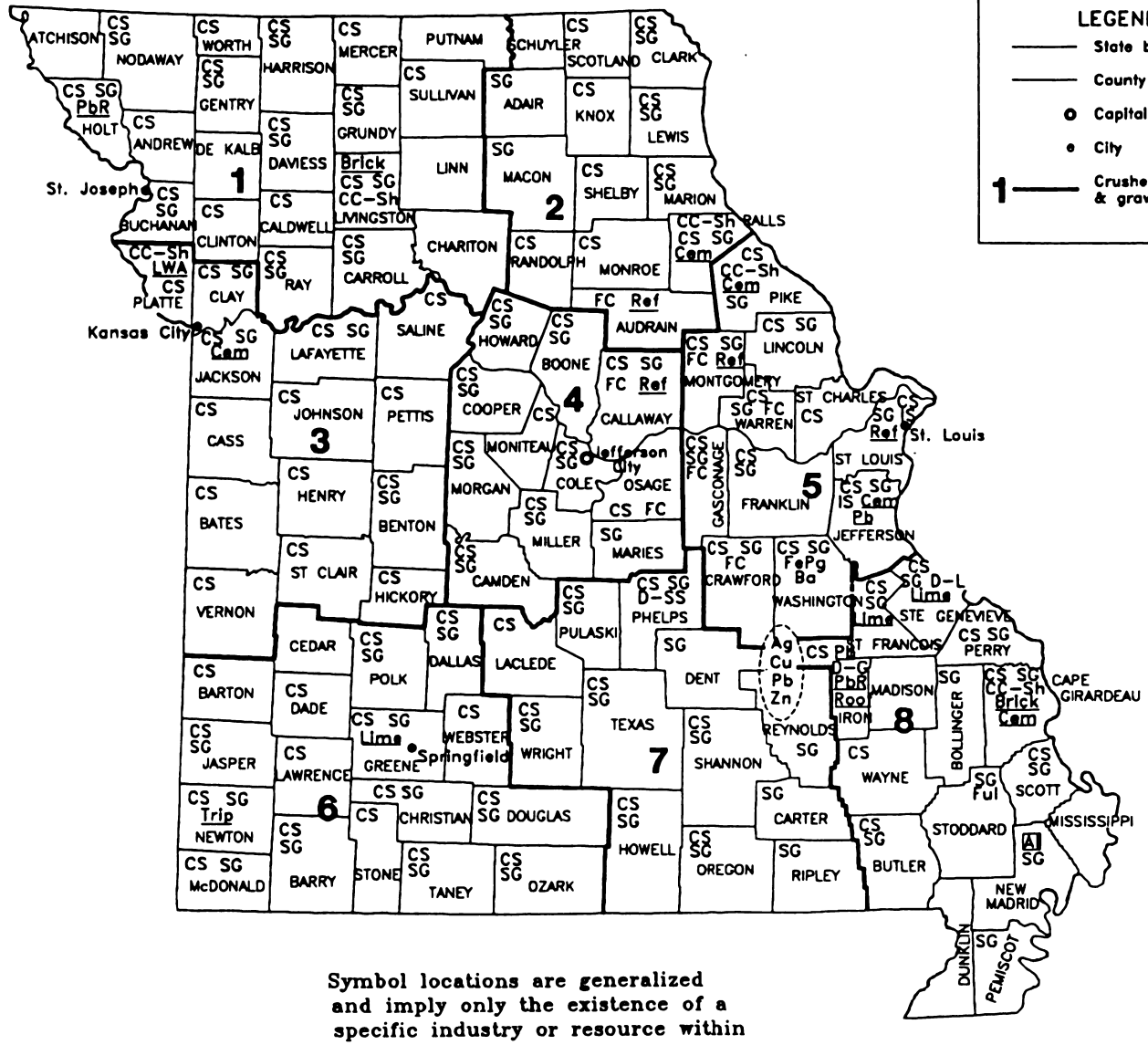
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	2,820	12,900	1,430	6,470	1,030	4,840
Asphaltic concrete aggregates and road base materials[3]	2,130	9,960	2,280	8,050	649	1,770
Unspecified:[4]						
Actual	—	—	797	3,830	31	138
Estimated	110	458	844	3,810	270	885
Total	5,060	23,400	5,350	22,200	1,980	7,640

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill and road and other stabilization (cement).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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MISSOURI



Symbol locations are generalized and imply only the existence of a specific industry or resource within a county or mineral district.

LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
[A]	Aluminum plant
Brick	Brick
CC-Sh	Common Clay & Shale
Cem	Cement plant
CS	Crushed Stone
Cu	Copper
D-G	Dimension Granite
D-L	Dimension Limestone
D-SS	Dimension Sandstone
FC	Fire Clay
Fe	Iron
FePg	Iron Oxide pigments
Ful	Fuller's Earth
Is	Industrial Sand
Lime	Lime plant
LWA	Lightweight Aggregate plant
Pb	Lead
Pb	Lead smelter
PbR	Lead Recycling facility
Trip	Tripoli plant
Ref	Refractory Clay Products plant
Roof	Roofing Granule plant
SG	Sand and Gravel
Zn	Zinc
	Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MISSOURI

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Missouri Department of Natural Resources, Division of Geology and Land Survey, for collecting information on all nonfuel minerals.

In 1995, for the second consecutive year, Missouri ranked 10th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $1.1 billion, about a 2% increase from that of 1994. This followed a 27% increase from 1993 to 1994 (based on final data). The State accounted for almost 3% of the U.S. total nonfuel mineral production value.

Crushed stone, by value, has been Missouri's leading mineral commodity since 1993 when it surpassed portland cement and lead. In 1995, lead was second and portland cement was third. These three commodities accounted for 75% of the State's total nonfuel mineral value. Missouri's 1995 increase, relatively small compared to that of 1994, helped the State maintain its rank among the States. The increased values of lead and lime, and smaller increases in crushed stone, copper, and zinc, more than offst drops in portland cement, construction sand and gravel, and iron ore. In 1994, a banner year for Missouri's minerals industry, nearly all nonfuel mineral commodity values increased. Substantial increases in crushed stone, portland cement, lead, and construction sand and gravel values accounted for about 93% of 1994's increased nonfuel mineral value. Compared with 1994 other nonfuel mineral values that increased in 1995 were fuller's earth clays, silver, and bentonite clays. Decreases occurred in industrial sand and gravel, masonry cement, common clays, fire clays, and gemstones.

Missouri is, by a large measure, the top lead producing State in the Nation. Production in Missouri and the country remained significantly lower than

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MISSOURI[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	4,060,000	$201,000	4,730,000	$265,000	3,980,000	$223,000
Clays[3]	thousand metric tons	1,180	7,740	1,250	7,910	1,110	7,190
Copper[4]	metric tons	6,980	14,100	7,720	18,900	8,500	26,000
Gemstones		NA	46	NA	67	NA	58
Iron ore (usable)	thousand metric tons	287	W	W	W	W	W
Lead[4]	metric tons	277,000	194,000	290,000	238,000	289,000	267,000
Sand and gravel:							
Construction	thousand metric tons	[e]6,400	[e]19,800	9,760	36,500	8,400	31,900
Industrial	metric tons	520,000	9,390	559,000	9,970	731,000	9,640
Silver[4]	do.	40	5,580	40	6,860	41	6,970
Stone (crushed)	thousand metric tons	53,400	239,000	68,900	330,000	69,500	337,000
Zinc[4]	metric tons	40,200	40,900	42,000	45,600	42,000	49,100
Combined value of barite, cement (masonry), clays [bentonite (1995), fuller's earth], iron oxide pigments (crude), lime, stone [dimension (1993, 1995), dimension granite (1994)], and values indicated by by symbol W		XX	123,000	XX	128,000	XX	148,000
Total		XX	855,000	XX	1,090,000	XX	1,110,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

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during the 1970's and early 1980's. The State's lead industry marked a low year in 1984, producing a little more than 278,000 metric tons[2] (recoverable content of ores). This, in part, resulted from restrictions by the Federal Government on the use of lead in paints, as a gasoline additive, and in advancing vehicle battery technologies. But, a prolonged strike at two facilities in 1984 was the most significant reason for this decline. Following a modest, although fluctuating, recovery from 1985-90 (381,000 tons were produced in 1990), lead output declined in 1993 to just below the 1984 level. Missouri lead production has rebounded modestly since 1993; production in 1995 was 4% greater than that of 1993, the year of lowest production during the 1990's.

Compared to USGS estimates of quantities produced in the other 49 States in 1995, Missouri remained first in lead and fire clays and second in iron oxide pigments. The State also continued to be one of the top three in lime, third in crushed stone and iron ore, third of four barite-producing States, fourth in zinc, fifth in fuller's earth, and seventh in copper and silver. Missouri dropped from 5th to 6th in portland cement production and from 9th to 11th in common clays. No bentonite production was reported for 1994. Additionally, Missouri mines and plants produced substantial quantities of construction and industrial sand and gravel and masonry cement.

The Missouri Division of Geology and Land Survey (MDGLS)[3] reported that a variety of projects continued in 1995 for the State's metals industry. At least four major companies explored for Olympic Dam-type iron-copper-gold deposits. Placer Dome Inc. was the most prominent of these companies, drilling several holes in southeast Missouri before ending exploration in late spring. Limited exploration also proceeded for sediment-hosted base metal deposits, primarily lead and zinc. In Iron County, Cominco American, Inc. continued closure of its Magmont Mine and mill, which ceased operation in late spring 1994.

Construction continued on the Chemical Lime Co. plant adjacent to the Mississippi River in Ste. Genevieve County. Scheduled for opening in 1996, the plant will have two coal-fired preheater rotary kilns, each with a daily capacity of 1,225 tons (1,350 short tons). Annual capacity will be about 815,000 tons (900,000 short tons). Plant operations will be automated with the best available, state-of-the-art, environmental control technology. Most production was planned for desulfurization and other environmental use markets along the Mississippi and Ohio Rivers.

Opposition to crushed stone quarries was strong in several areas of the State, particularly near Kansas City, Springfield, and West Plains. Numerous complaints regarding blasting and truck traffic were received by regulatory agencies.

Bar and in-channel construction sand and gravel operations were significantly affected by new Federal mining regulations. The U.S. Army Corps of Engineers, in cooperation with the Missouri Department of Natural Resources and the Department of Conservation, was responsible for regulation enforcement. The regulations limit the depth that can be excavated and the distance that must be left untouched between the water's edge, permanent vegetation, and the pit itself. Although operations of all sizes were expected to be affected, MDGLS expected that the smaller the mining operation the greater the impact. Flood plain operations and in-stream dredges on the major rivers were not affected.

Continental Cement Co. purchased the refractory clay properties of Allied Chemical Co. near Owensville, Gasconade County. Continental is using the clay in its cement plant near Hannibal, Ralls County. The demand for refractory clays in cement manufacturing increased, in part because of some apparent tightening of available supplies on the open market.

U.S. Borax Inc., a subsidiary of RTZ Corp. of Great Britain, announced plans to sell US Silica Co. to D. George Harris and Associates, a New York-based inorganic chemicals and minerals business. The transaction includes US Silica's industrial sand mine and plant near Pacific, in eastern Missouri.

Lafarge Corp. of Reston, VA, announced its intention to modernize its Sugar Creek cement plant. The new plant will utilize state-of-the-art pollution control technology and have an annual capacity of 815,000 tons. Limestone used in the facility will come from an underground mine on the property. The $135 million project is expected to come on line by the year 2000.

The Society of Economic Geologists held its 75th anniversary conference in St. Louis in early June and addressed the subject of lead-zinc resources contained in sedimentary deposits. Several field trips were conducted in conjunction with the conference, including two trips to the Viburnum Trend portion of the Southeast Missouri lead-zinc district.

After 75 years, the Department of the Interior's U.S. Bureau of Mines Rolla Research Center (RRC) in Rolla was closed in December. Approximately 32 employees were affected. The office was established on the grounds of the University of Missouri School of Mines and Metallurgy in the summer of 1920. More than 750 scientific articles have been published by the RRC since it began operations, and the Center has

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been instrumental in numerous mining and metallurgical developments. In recent years, the Center has been involved in developing remediation techniques that are environmentally friendly. The RRC was noted for work with material containing heavy metals, especially lead-, zinc-, and chromium-contaminated wastes.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

[3]This report includes information provided by the MDGLS.

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TABLE 2

MISSOURI: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	235	$1,070	$4.56
Riprap and jetty stone	4,160	14,300	3.45
Filter stone	387	1,370	3.55
Other coarse aggregate	427	1,950	4.57
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,460	24,300	7.04
Bituminous aggregate, coarse	1,840	10,200	5.52
Bituminous surface - treatment aggregate	1,040	4,540	4.37
Railroad ballast	W	W	4.65
Other graded coarse aggregate	1,180	6,720	5.68
Fine aggregate (-3/8 inch):			
Stone sand, concrete	275	1,380	5.01
Stone sand, bituminous mix or seal	202	1,460	7.21
Screening, undesignated	916	3,050	3.33
Other fine aggregate	37	161	4.35
Coarse and fine aggregates:			
Graded road base or subbase	10,700	42,900	4.01
Unpaved road surfacing	2,450	12,000	4.89
Terrazzo and exposed aggregate	W	W	6.33
Crusher run or fill or waste	712	3,190	5.72
Other coarse and fine aggregates	2,820	19,300	6.86
Other construction materials[3]	999	6,910	6.91
Agricultural:			
Agricultural limestone	1,850	18,300	9.87
Poultry grit and mineral food	(4)	(4)	5.71
Other agricultural uses	(4)	(4)	4.53
Chemical and metallurgical:			
Cement manufacture	6,880	21,000	3.05
Lime manufacture	318	1,600	5.02
Dead-burned dolomite manufacture	(4)	(4)	4.98
Flux stone	(4)	(4)	4.97
Chemical stone	(4)	(4)	4.13
Sulfur oxide removal	(4)	(4)	5.51
Special:			
Asphalt fillers or extenders	(4)	(4)	4.70
Other fillers or extenders	(4)	(4)	5.51
Other specified uses not listed	628	3,170	5.05
Unspecified:[5]			
Actual	13,100	63,100	4.81
Estimated	14,200	68,200	4.78
Total	68,900	330,000	4.80

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, granite, limestone, and sandstone.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes roofing granules and waste material.
[4]Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

MISSOURI: CRUSHED STONE SOLD OR USED, BY KIND [1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	168	49,900	$223,000	$4.47	194	64,400	$303,000	$4.71
Dolomite	16	2,200	9,070	4.13	18	2,960	13,600	4.58
Granite	2	W	W	6.08	2	W	W	9.55
Sandstone	2	W	W	3.37	1	W	W	3.24
Total	XX	53,400	239,000	4.48	XX	68,900	330,000	4.79

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes "Limestone-dolomite," reported with no distinction between the two.

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TABLE 4

MISSOURI: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY DISTRICT[1] AND USE

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	339	1,640	338	1,220	W	W	W	W
Coarse aggregate, graded[3]	W	W	258	981	1,080	6,090	778	4,310
Fine aggregate (-3/8 inch)[4]	W	W	59	229	W	W	W	W
Coarse and fine aggregate[5]	1,110	6,860	696	3,470	1,180	5,910	1,380	6,190
Other construction materials[6]	222	1,030	—	—	299	1,780	263	1,080
Agricultural[7]	63	237	W	W	W	W	71	256
Chemical and metallurgical[8]	—	—	W	W	W	W	1,360	1,500
Special[9]	—	—	—	—	—	—	—	—
Other miscellaneous uses[10]	—	—	—	—	—	—	—	—
Unspecified:[12]								
Actual	1,840	12,900	—	—	2,580	15,100	—	—
Estimated	1,470	8,390	873	4,470	1,380	6,520	2,670	12,500
Total	5,040	31,100	3,240	13,600	9,010	57,500	6,530	25,900

	District 5		District 6		District 7		District 8	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	588	2,510	W	W	W	W	W	W
Coarse aggregate, graded[3]	2,060	12,500	1,550	14,800	616	2,680	W	W
Fine aggregate (-3/8 inch)[4]	849	3,080	W	W	W	W	41	123
Coarse and fine aggregate[5]	6,270	26,000	1,650	8,060	264	1,050	4,440	32,700
Other construction materials[6]	—	—	599	2,930	49	234	4,790	16,200
Agricultural[7]	W	W	359	1,800	91	430	W	W
Chemical and metallurgical[8]	W	W	W	W	—	—	W	W
Special[9]	—	—	W	W	—	—	—	—
Other miscellaneous uses[10]	—	—	W	W	—	—	—	—
Unspecified:[11]								
Actual	5,960	22,600	1,640	7,670	—	—	360	1,470
Estimated	2,710	12,200	3,290	15,600	789	3,660	1,060	4,790
Total	20,000	82,900	9,470	52,900	1,810	8,060	12,900	54,700

W Withheld to avoid disclosing company proprietary data; included in "Total."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes filter stone, macadam, riprap and jettystone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface - treatment aggregate, railroad ballast, and other graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.

[6]Includes waste materials.

[7]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

[8]Includes cement manufacture, chemical stone for alkali works, dead-burned dolomite manufacture, flux stone, lime manufacture, and sulfur oxide removal.

[9]Includes asphalt fillers or extenders and other fillers or extenders.

[10]Includes other specified uses not listed.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

MISSOURI: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,650	$18,600	$4.01
Plaster and gunite sands	93	356	3.83
Concrete products (blocks, brick, pipe, decorative, etc.)	752	2,770	3.68
Asphaltic concrete aggregates and other bituminous mixtures	1,300	4,130	3.19
Road base and coverings	404	1,600	3.97
Fill	413	869	2.10
Snow and ice control	95	414	4.36
Filtration	77	312	4.05
Other[2]	12	81	6.75
Unspecified:[3]			
Actual	116	650	5.60
Estimated	1,860	6,690	3.61
Total or average	9,760	36,500	3.74

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes railroad ballast and roofing granules.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

MISSOURI: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

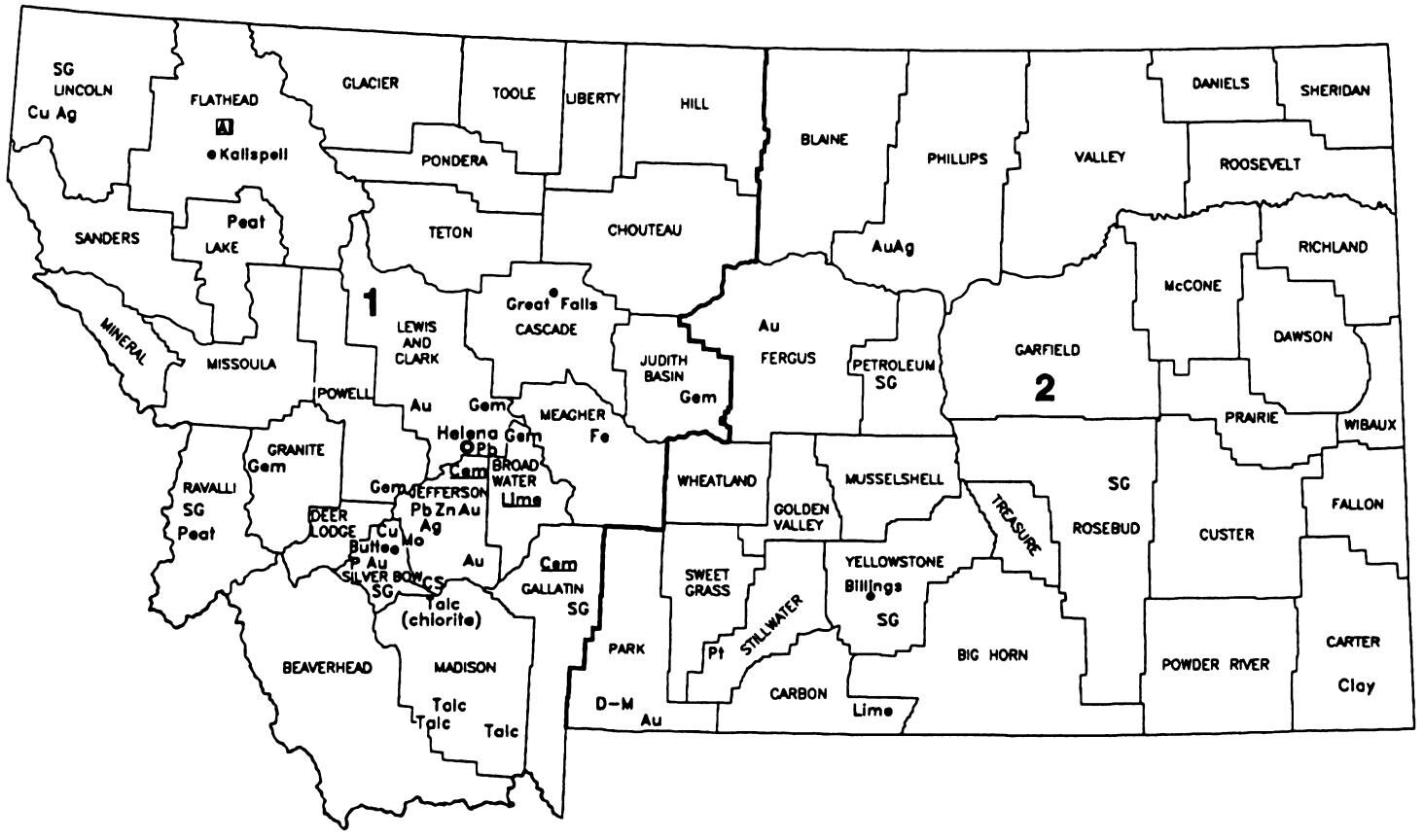
Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	129	727	W	W	—	—	1,230	4,760
Asphaltic concrete aggregates and road base materials[3]	47	221	109	420	W	W	554	2,130
Other miscellaneous uses[4]	29	158	W	W	—	—	W	W
Unspecified:[5]								
Actual	—	—	34	113	—	—	—	—
Estimated	225	684	103	377	W	W	W	W
Total	430	1,790	378	1,460	683	2,010	2,220	8,600

	District 5		District 6		District 7		District 8	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	3,460	12,000	173	1,900	W	W	267	1,150
Asphaltic concrete aggregates and road base materials[3]	975	2,490	W	W	279	745	116	491
Other miscellaneous uses[4]	7	45	W	W	W	W	—	—
Unspecified:[5]								
Actual	43	412	25	82	13	43	(6)	1
Estimated	317	1,530	11	81	203	759	10	19
Total	4,800	16,500	225	2,160	634	2,340	394	1,660

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill.
[4]Includes filtration, railroad ballast, roofing granules, and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[6]Less than 1/2 unit.

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MONTANA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
A	Aluminum plant
Au	Gold
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
Cu	Copper
D-M	Dimension Marble
Fe	Iron
Gem	Gemstones
Gyp	Gypsum
Lime	Lime plant
Mo	Molybdenum
P	Phosphate rock plant
Peat	Peat
Pb	Lead Smelter
Pt	Platinum group metals
SG	Stone and Gravel
Talc	Talc minerals
Zn	Zinc

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF MONTANA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Montana Bureau of Mines and Geology for collecting information on all nonfuel minerals.

Montana remained 22d in the Nation in nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $581 million, a 7% increase from that of 1994. This followed a 12.2% increase from 1993 to 1994 (based on final data). The State accounted for 1.5% of the U.S. total nonfuel mineral production value.

Overall, metallic minerals accounted for 77% of the State's total nonfuel mineral value. By value, gold was Montana's leading nonfuel mineral, followed closely by copper. Portland cement, the State's third-leading nonfuel mineral commodity, was its leading industrial mineral. Portland cement accounted for nearly 43% of the State's total industrial mineral value. During the past 2 years, most of the rise in nonfuel mineral production value resulted from increases in copper, molybdenum, and portland cement. To a lesser degree, these increases were mitigated by decreases in gold in both years and a smaller drop in silver in 1994. A smaller increase in construction sand and gravel also contributed to 1995's value increase. Compared with 1994, other nonfuel minerals that increased in value were platinum, zinc, talc and pyrophyllite, bentonite, silver, and dimension stone. Decreases occurred in palladium, lime, lead, crushed stone, gemstones, masonry cement, and barite.

Based on USGS estimates of the quantities produced in the 50 States in 1995, Montana continued as the only U.S. producer of primary platinum and palladium. The State remained first in the production of talc and pyrophyllite; second in bentonite; fourth in copper and lead; fifth in gold, molybdenum, and zinc; and sixth in silver. Because of the lack of a common physical unit to properly measure the quantity of gemstones produced, gem production is measured by value. The State dropped from sixth to seventh in gemstones. Significant quantities of construction sand

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN MONTANA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	W	W	[3]28	W	W	W
Gemstones		NA	$281	NA	$3,400	NA	$1,720
Gold[4]	kilograms	14,300	166,000	[3]12,600	[3]156,000	[3]12,300	[3]148,000
Lead[4]	metric tons	W	W	9,940	8,140	W	W
Palladium	kilograms	6,500	25,300	6,440	29,400	6,400	29,200
Platinum	do.	1,800	21,400	1,960	25,300	2,000	25,800
Sand and gravel (construction)	thousand metric tons	[e]10,000	[e]32,000	7,360	28,800	8,500	34,400
Silver[4]	metric tons	127	17,600	71	12,000	72	12,200
Stone (crushed)	thousand metric tons	2,820	10,400	2,320	8,830	1,900	7,400
Talc and pyrophyllite	metric tons	350,000	11,900	W	W	W	W
Zinc[4]	do.	W	W	21,000	22,800	21,000	24,600
Combined value of barite, cement [masonry (1994-95), portland], clays [bentonite, common, fire (1993-94)], copper, iron ore [usable (1993)], lime, molybdenum, peat, phosphate rock (1993), sand and gravel (industrial), stone (dimension), and values indicated by symbol W		XX	199,000	XX	249,000	XX	298,000
Total		XX	484,000	XX	543,000	XX	581,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data, value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

[5]Placer canvassing discontinued beginning 1994.

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and gravel and lime were produced in Montana.

The Montana Bureau of Mines and Geology[2] reported that the State's mineral industry continued its revival from the doldrums of 1993. Mineral commodity prices showed steady increases, and demand for most minerals was steady to strong.

In gold development, Pegasus Gold Inc.'s Beal Mountain Mine received a water discharge permit. The company planned to continue the project through 1996 and possibly 1997, although it had previously announced a planned closure for 1995 and had recorded that 3.8 million metric tons of reserves remained. Near Jefferson City, Pegasus Gold's Montana Tunnels Mine received a permit allowing the company to construct a 26-meter (85-foot) lift on its impoundment. Pegasus also reported increased gold recovery from its new gravity plant in the mill. At the Zortman-Landusky Mine, a silver and gold heap-leach operation, Pegasus completed mining operations at the August pit and was halfway through permitting for the Zortman expansion. A draft environmental impact statement was completed and permits were expected in 1996.

Other companies continued to develop gold deposits. Near Lincoln, the Seven-Up Pete Joint Venture of Phelps Dodge Corp. and Canyon Resources Corp. worked on its "completeness review stage" of its mining draft environmental impact statement. The proposed heap leach project will be the largest in Montana. Near Whitehall, Jefferson County, Placer Dome Inc.'s Golden Sunlight Mine did not experience any more ground stability problems. After restarting the mill and operation in February, the mine expanded its tailings facility and continued decommissioning of the old impoundment area. Near Gardiner, Park County, TVX Gold, Inc. continued developing its Crevise property and Mineral Hill Mine. TVX also expanded reserves on both properties. Near Philipsburg, Cable Mountain Mines Co. continued drilling on its Basin Gulch project. Cable also drilled several holes at the Cable Mountain Mine. Near Butte, Battle Mountain Exploration Co. drilled several holes at the Tuxedo Mine. Cominco American Resources, Inc. drilled a number of stratigraphic holes, one of which was in Soap Gulch. ASARCO Incorporated drilled and later abandoned the Highland project near the Highland Mine, leaving its joint partner, Orvana Minerals Corp., to continue with the project. Orvana also drilled its Baldy Mountain prospect northeast of Lincoln. Near Dillon, Cameco U.S., Inc. drilled into a volcanic formation in search of gold in the Grasshopper Creek drainage area. Near Virginia City, Hanover Gold Co., Inc. drilled at the Kearsarge property. Royalstar Resources, Ltd. drilled the Garrison property. Both are in upper Alder Gulch. Near Avon, Phelps Dodge drilled the Irish Hill property. Near Helena, Newmont Exploration, Ltd. drilled and abandoned the Pike's Gulch or Grady Ranch project.

The Stillwater Mining Co. continued construction of its 550-meter mine shaft. This was part of the company's expansion project at its Stillwater platinum-group metal mine near Columbus. Stillwater also expanded its mill capacity to 1,800 metric- tons- per-day and began construction on a base metal refinery at the smelter. All projects were scheduled for completion during 1996.

Montana Resources, Inc. enlarged the grinding circuit at its Continental Copper Mine mill near Butte. This was done to compensate for increased processing time caused by the crushing of harder ore. This resulted in lower than expected profits, despite strong copper and molybdenum prices.

In talc mining, Barretts Minerals Inc. has embarked on an aggressive development program in the southwestern corner of the State, near Dillon. Barretts spent approximately $5 million in expanding its talc milling and packaging facility, and anticipated an equivalent amount would be spent in 1996. Luzenac America Inc. continued development of the Sappington and Three Forks talc processing facilities. Luzenac continued prestripping activities at the Yellowstone Mine, and was planning to deepen the decline at the Beaverhead Mine. Both companies, anticipating an increased demand for talc in the near future, were preparing for the market change. Prices have shown a steady increase during recent years.

Near Virginia City, Cominco American opened the first commercial garnet operation in the State. The operation is targeting garnet in the 3/16-inch to 250-mesh-size range for the abrasives industry.

Near Lewistown, Vortex Mining Co. completed the first full year of sapphire production from the company's new shaft. The stones were larger and of better quality than first expected. Canyon Resources continued reclamation on the closed C. R. Kendall heap-leach gold and silver mine near Hilger. Mining operations were completed in 1994, while leaching and reclamation will continue for two more years.

In the Butte area, Rhone-Poulenc Basic Chemicals Co. mothballed its elemental phosphorus plant, and was contracting the processing of its Idaho-sourced ore.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

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All 1995 USGS mineral production data are estimates as of December 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Montana Bureau of Mines and Geology.

TABLE 2
MONTANA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone	23	$152	$6.61
Coarse and fine aggregates: Graded road base or subbase[3]	144	525	3.65
Chemical and metallurgical: Cement manufacture	897	3,390	3.77
Other miscellaneous uses:[4]			
Unspecified:[5]	408	2,000	4.90
Actual	368	1,420	3.85
Estimated	482	1,350	2.81
Total	2,320	8,830	3.80

[1]Includes granite, limestone, miscellaneous stone, sandstone and quartzite, traprock and volcanic cinder, and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes bituminous aggregate (coarse), screening (undesignated), unpaved road surfacing, and terrazzo and exposed aggregate.
[4]Includes chemical stone for alkali works, lime manufacture, mine dusting or acid water treatment, poultry grit and mineral food, and sulfur oxide removal.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
MONTANA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	11	1,820	$7,070	$3.89	9	1,410	$6,010	$4.26
Granite	2	W	W	2.52	2	W	W	2.55
Traprock	3	W	W	2.94	5	338	1,140	3.36
Sandstone and quartzite	4	418	1,760	4.20	2	W	W	3.84
Volcanic cinder and scoria	3	3	7	2.33	3	5	12	2.40
Miscellaneous stone	1	17	51	3.00	1	W	W	3.86
Total	XX	2,820	10,400	3.68	XX	2,320	8,830	3.80

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

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TABLE 4

MONTANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	947	$4,890	$5.16
Plaster and gunite sands	6	41	6.83
Asphaltic concrete aggregates and other bituminous mixtures	488	3,880	7.95
Road base and coverings[2]	2,830	10,200	3.62
Fill	366	1,180	3.23
Snow and ice control	93	263	2.83
Filtration	15	62	4.13
Other[3]	93	556	5.98
Unspecified:[4]			
Actual	341	1,030	3.03
Estimated	2,190	6,660	3.05
Total or average	7,360	28,800	3.91

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

MONTANA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

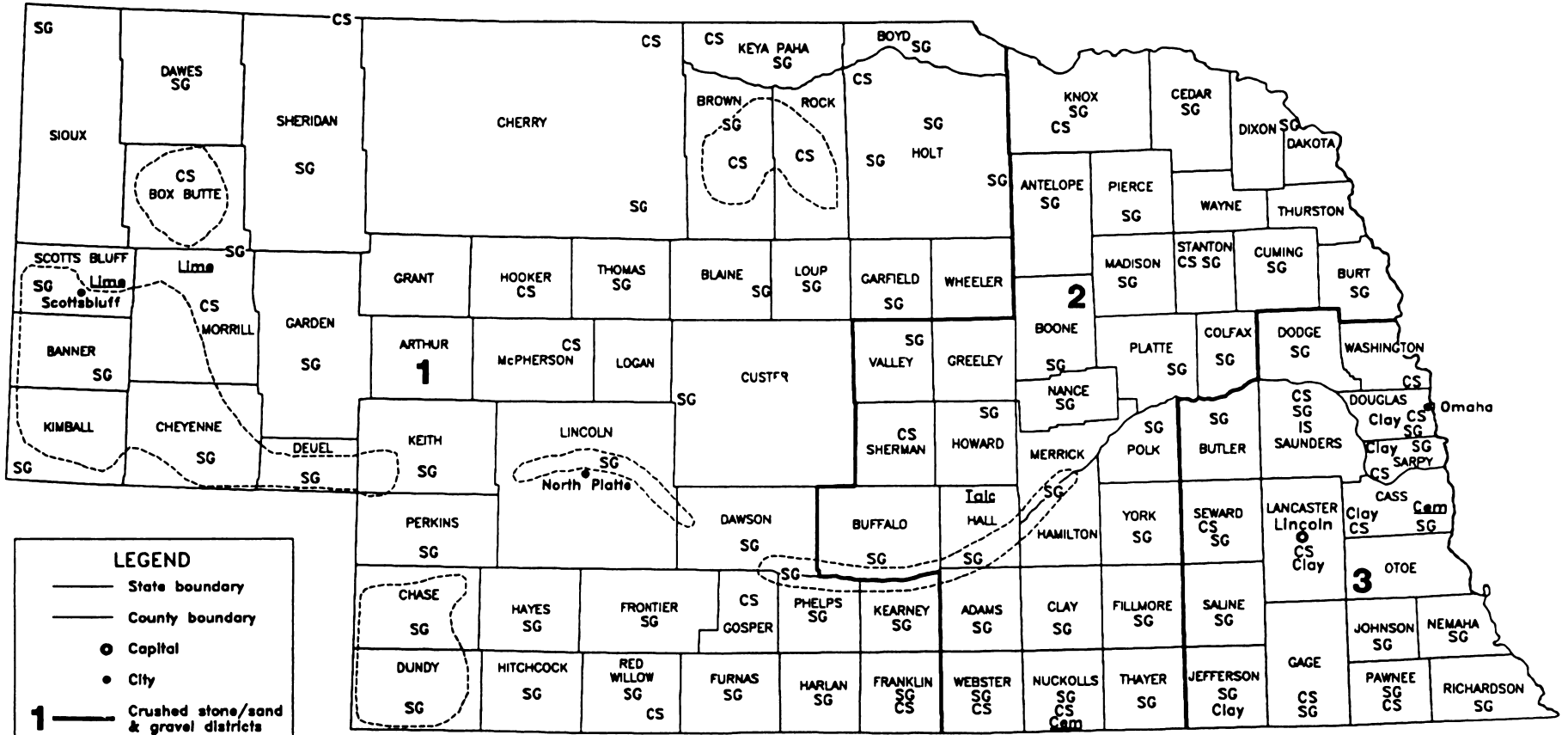
Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregates[2]	661	3,210	292	1,720
Asphaltic/bituminous mixtures	312	2,980	176	903
Road base and coverings[3]	2,010	7,430	822	2,810
Fill	269	867	97	314
Snow and ice control	89	248	4	14
Other miscellaneous uses[4]	27	110	80	508
Unspecified:[5]				
Actual	341	1,030	—	—
Estimated	987	3,730	1,200	2,930
Total	4,700	19,600	2,670	9,190

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEBRASKA



CS & SG symbols often represent numerous locations within a county, and not a specific location.

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NEBRASKA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the University of Nebraska-Lincoln, Nebraska Geological Survey, for collecting information on all nonfuel minerals.

In 1995, for the 2d consecutive year, Nebraska ranked 41st among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $142 million, a 3% decrease from that of 1994. This followed a 16% gain in value from 1993 to 1994. The State accounted for a little less than 0.5% of the U.S. total nonfuel mineral production value. Construction sand and gravel, followed by portland cement, and crushed stone continued to be Nebraska's leading nonfuel mineral commodities by value. In 1995, construction sand and gravel accounted for about 40% of the State's total nonfuel mineral value. Compared with 1994, the values of construction sand and gravel and common clays increased,while portland cement, crushed stone, lime, and masonry cement decreased. All the States's portland cement was manufactured in one plant in Louisville, in eastern Nebraska. Metals produced in the State, mostly raw steel and lead, were processed from materials acquired from other domestic and foreign sources. Uranium was in situ leach mined at one location in northwestern Nebraska but is not included in USGS statistics because it is a fuel mineral.

The Nebraska Geological Survey[2] (NGS) has been very active for the past several years, conducting studies of the State's geology and its mineral and water resources. Geologists from 10 of the State geological surveys (Nebraska, Colorado, Iowa, Kansas, Minnesota, Missouri, Montana, North Dakota, South Dakota, and Wyoming) and the USGS jointly conducted ongoing exploratory studies of the Missouri River Basin, especially from Omaha to Kansas City, Missouri. These studies were initiated because of increasing concerns about the interactions and potential effects of modern industry, mining, agriculture, and society on this busy urban-rural corridor. The joint effort will result in a large database, with maps and references, that will include a variety of information about the basin, including details about soil, rock formations, and water.

The Nebraska Earth Science Education Network recently launched a pilot project that will provide kindergarten through 12th grade (K-12) teachers with information about the Earth through advanced technology. Nebraska's Institute of Agriculture and Natural Resources and the University of Nebraska-Lincoln Computing Resource Center, together with one of the State's U.S. Senators, obtained a $200,000 grant from the National Aeronautics and Space Administration. The grant was used to purchase computer equipment for each participating school and to develop an information transfer program, including a home page on the World Wide Web. Teachers in seven schools will use personal computers and the Internet to access natural resources data, particularly from satellites and the space shuttle. The project is designed to promote information exchange between

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEBRASKA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	192	$932	206	$867	222	$1,030
Lime	do.	24	1,230	24	904	13	668
Sand and gravel (construction)	do.	e12,900	e41,900	15,000	49,200	16,000	55,200
Stone (crushed)	do.	6,760	38,900	6,890	41,600	6,600	39,600
Combined value of cement, gemstones, and sand and gravel (industrial)		XX	43,200	XX	53,600	XX	45,200
Total		XX	126,000	XX	146,000	XX	142,000

e Estimated. p Preliminary. XX Not applicable.
[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2] Data are rounded to three significant digits; may not add to totals shown.

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university and K-12 educators.

In mineral industry news, Potash Corp. of Saskatchewan (PCS) agreed to acquire 100% of Texasgulf Inc.'s U.S. operations for $810 million in cash. Included in this transaction was an underground limestone mine near Weeping Water that Texasgulf has operated since 1975. The Nebraska Public Power District is experimenting with burning low-BTU coal with fly ash to help cleanse the plant's boiler furnaces of slag.

The NGS produced several mining-related publications which were published by Nebraska's Conservation and Survey Division, including a 1995 update of *Mineral Facts for Nebraska*, *Test-Hole Drilling in Nebraska*, and water and mineral test-hole log books for holes drilled in Boyd, Fillmore, and Thayer Counties. Other recent publications (1994) still available were the *Directory of Quarries, Pits and Mines in Nebraska* and the *GIS Data Base and Assessment of the Physical Natural Resources of the Cedar River Basin, Nebraska*. Information concerning these and other State geologic publications is available from the office of the State Geologist.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the Nebraska Geological Survey.

TABLE 2

NEBRASKA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone[3]	344	$2,720	$7.92
Coarse aggregate, graded:			
Concrete aggregate, coarse	763	5,400	7.08
Bituminous aggregate, coarse	W	W	6.43
Railroad ballast	5	31	6.20
Fine aggregate (-3/8 inch): Screening, undesignated	83	127	1.53
Coarse and fine aggregates:			
Graded road base or subbase	W	W	6.73
Unpaved road surfacing	376	2,770	7.37
Crusher run or fill or waste	403	2,670	6.62
Other construction materials	683	4,470	6.54
Agricultural: Agricultural limestone[4]	286	2,400	8.39
Chemical and metallurgical: Cement manufacture	(5)	(5)	3.80
Special: Asphalt fillers or extenders	(5)	(5)	16.10
Unspecified: Actual[6]	2,560	15,900	6.20
Total	6,890	41,600	6.04

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes limestone.

[2]Data are rounded to three significant digits.

[3]Includes other coarse aggregate.

[4]Includes poultry grit and mineral food, and other agricultural uses.

[5]Withheld to avoid disclosing company proprietary data; included in "Total."

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
NEBRASKA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	14	6,760	$38,900	$5.75	12	6,890	$41,600	$6.04

[1]Data are rounded to three significant digits.

TABLE 4
NEBRASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,950	$16,200	$3.26
Plaster and gunite sands	160	637	3.98
Concrete products (blocks, brick, pipe, decorative, etc.)	164	521	3.18
Asphaltic concrete aggregates and other bituminous mixtures	1,510	5,230	3.46
Road base and coverings[2]	4,200	13,000	3.10
Fill	594	1,210	2.03
Snow and ice control	181	731	4.04
Railroad ballast	30	275	9.17
Other[3]	123	558	4.54
Unspecified:[4]			
Actual	562	2,240	3.98
Estimated	2,480	8,600	3.47
Total or average	15,000	49,200	3.29

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes roofing granules
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5
NEBRASKA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

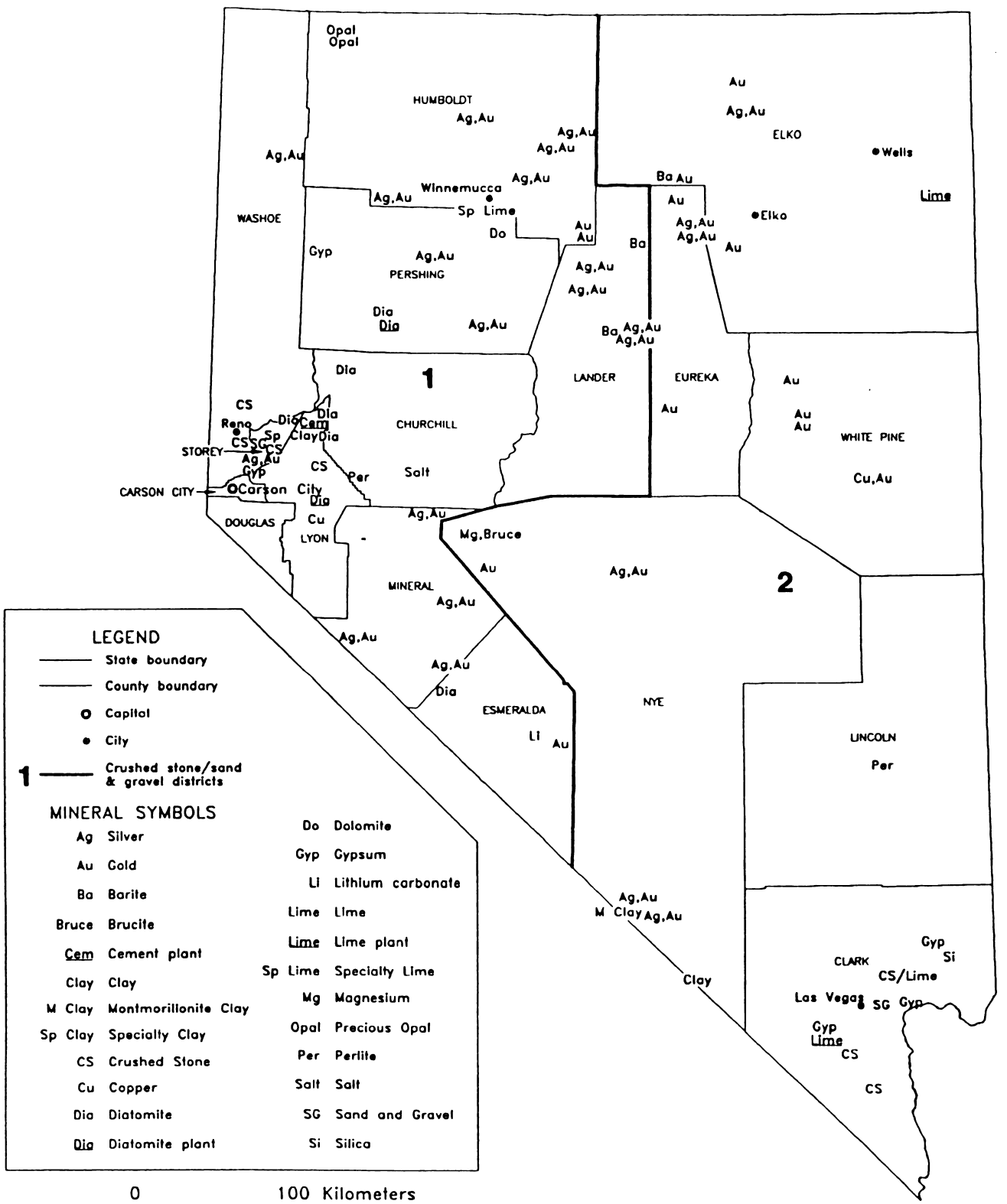
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	437	1,650	1,180	3,450	3,660	12,200
Asphaltic-bituminous mixtures	313	954	588	2,200	[3]608	[3]2,080
Road base and coverings[4]	1,180	2,780	1,350	4,190	1,680	6,050
Fill	120	259	290	483	184	466
Other miscellaneous uses[5]	57	330	67	235	208	999
Unspecified:[6]						
Actual	148	435	37	130	376	1,670
Estimated	389	1,200	1,360	4,830	728	2,560
Total	2,640	7,610	4,870	15,500	[3]7,440	[3]26,000

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes unspecified within all districts.
[4]Includes fill, road and other stabilization (cement and lime).
[5]Includes railroad ballast, roofing granules, and snow and ice control.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEVADA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NEVADA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Nevada Bureau of Mines and Geology for collecting information on all nonfuel minerals.

Nevada, the Nation's leading State in gold and silver production, overall ranked second in 1995 in nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 exceeded $2.9 billion, a decrease of more than 4% from that of 1994. This followed a substantial 9% increase in 1994 from 1993. Nevada mines provided 65% and 46% of the Nation's gold and silver, respectively. Overall, the State accounted for almost 8% of the U.S. total nonfuel mineral production value.

Gold accounted for 86% of Nevada's nonfuel mineral value; industrial minerals, 9%; and silver, copper, and mercury, the remaining 5%. In 1995, a 5% decrease in the estimated value of gold accounted for most of the drop in the State's nonfuel mineral value. Small decreases occurred in the values of construction sand and gravel, lime, and portland cement. In 1994, $200 million gold and $17 million silver value increases fueled a 9% increase in Nevada's nonfuel mineral production value that year (based on final 1994 data). Compared with 1994, the value of the following commodities increased in 1995: silver, diatomite, crushed stone, copper, lithium minerals, industrial sand and gravel, gypsum, bentonite, and gemstones. Decreases occurred in gold, construction sand and gravel, lime, portland cement, barite, magnesite, fuller's earth, perlite, and salt.

Based on USGS estimates of quantities produced in the 50 States during 1995, Nevada remained first in gold, silver, barite, and mercury and the only State having magnesite and brucite production. The State retained its 1994 ranking in a number of other mineral commodities—it was second in diatomite and lithium minerals, fourth in perlite, fifth in gypsum, and eighth in copper. Nevada moved up from seventh to sixth in

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEVADA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Barite	metric tons	242,000	$9,100	[r]284,000	[r]$5,020	447,000	$9,600
Clays[4]	thousand metric tons	16	3,430	7	2,860	28	3,380
Copper[5]	metric tons	W	W	6,450	15,800	6,800	21,000
Gemstones		NA	660	NA	160	NA	364
Gold[5]	kilograms	211,000	2,450,000	[6]214,000	[6]2,650,000	[6]210,000	[6]2,520,000
Sand and gravel:							
Construction	thousand metric tons	[e]24,900	[e]108,000	22,700	106,000	20,000	95,000
Industrial	metric tons	480,000	W	572,000	W	640,000	W
Silver[5]	do.	713	98,500	673	115,000	683	116,000
Stone (crushed)	thousand metric tons	1,070	12,500	2,310	20,600	2,500	22,600
Combined value of brucite, cement (portland), clays (fuller's earth, kaolin), diatomite, fluorspar (1993), gypsum (crude), lime, lithium minerals, magnesite, mercury, perlite (crude), salt, and values indicated by symbol W		XX	144,000	XX	[r]153,000	XX	135,000
Total		XX	2,820,000	XX	[r]3,070,000	XX	2,920,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain barites; kind and value included with "Combined value" data.

[4]Excludes certain clays; kind and value included with "Combined value" data.

[5]Recoverable content from ores, etc.

[6]Placer canvassing discontinued beginning 1994. May include placer data from other sources.

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kaolin clay production. In addition, significant quantities of construction and industrial sand and gravel and lime were produced at mines and manufacturing plants in the State.

According to the Nevada Bureau of Mines and Geology (NBMG),[2] stability in the price of gold during 1995 helped the Nevada gold mining industry sustain high levels of production. Nevada's gold production, more than seven times that of the next highest State, helped bolster the United States' world position as second in gold production. Only South Africa produces more. NBMG stated that the mining of known reserves should be sufficient to sustain gold production at substantial levels for at least 20 years. According to State officials, the current boom in gold production is unprecedented in U.S. history, both in duration and amount. During the 1990's, Nevada will have produced more gold than any other state during any gold boom in U.S. history.

The Nevada Division of Minerals (NDM) of the State's Department of Business and Industry conducted a study of the State's active mining and exploration companies and concluded that gold exploration would likely continue at strong levels for the foreseeable future. The survey revealed that new discoveries continue to be made each year, both in established mining districts and in new areas. However, these new ore bodies are often at greater depths, where exploration and mining costs have been higher than average in recent years. Additionally, the study revealed that several current operations are producing substantial amounts of ore from underground rather than the more common open pit mines.

Silver production continued at high levels, chiefly as a byproduct or coproduct of gold. By producing more than three and one-half times as much as the next highest State, Nevada mines helped the State easily retain its nickname of the "Silver State."

Nevada is one of the fastest growing States in the Nation in terms of percentage increase in population. As a result, there is an increasing demand for raw construction materials to fulfill the needs of the expanding population. Production of crushed stone and gypsum (used to make sheetrock or wallboard) continued at relatively consistent levels.

Every February, the NDM, in cooperation with the NBMG, produces a booklet identifying the State's active mining operations. "Major Mines of Nevada" contains a directory of mines that were active the previous year, individual company production and employment statistics, and a series of maps showing the locations of the State's mines, geothermal plants, and petroleum fields. The booklet also includes some analysis of the data. "Major Mines" is supplemented by more complete statistics and analysis in "The Nevada Mineral Industry," a report that NBMG produces each summer. This publication contains an executive summary addressing exploration and production activity for the previous year, complete with numerous charts and graphs. It also includes individual chapters on metals, major precious metal deposits (including discoveries that have not been put into production), industrial minerals, geothermal energy, and oil and gas. This is followed by a directory of mining and milling operations with precise locations and contacts. Both publications are available in paper or in electronic form. The printed publications may be purchased directly from NBMG, or an electronic copy may be obtained for free via the Internet at the NBMG's Home Page on the World Wide Web (http://www.nbmg.unr.edu).

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data in this chapter are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the NBMG.

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TABLE 2

NEVADA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse and fine aggregates:			
Graded road base or subbase	208	$833	$4.00
Other construction materials[3]	615	5,570	9.05
Other miscellaneous uses:[4]	800	11,300	14.20
Unspecified:[5]			
Actual	648	2,660	4.11
Estimated	35	203	5.80
Total	2,310	20,600	8.93

[1]Includes dolomite, granite, limestone, miscellaneous stone, traprock, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes concrete aggregate (coarse), stone sand (concrete), screening (undesignated), and waste material.
[4]Includes dead-burned dolomite manufacture, lime manufacture, mine dusting or acid water treatment, poultry grit and mineral food, other agricultural uses, and sulfur oxide removal.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

NEVADA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5	r593	r$2,320	r$3.91	7	1,380	$13,000	$9.37
Dolomite	4	379	4,400	11.60	6	251	1,590	6.35
Granite	2	W	W	11.10	2	W	W	12.20
Trap rock	r2	W	W	r4.52	2	W	W	4.87
Volcanic cinder and scoria	1	W	W	16.60	1	54	W	2.20
Miscellaneous stone	2	W	W	4.69	2	W	W	4.79
Total	XX	1,610	12,500	7.80	XX	2,310	20,600	8.93

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.

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TABLE 4

NEVADA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1	
	Quantity	Value
Construction aggregates:		
Coarse aggregate, graded[3]	W	W
Fine aggregate (-3/8 inch)[4]	W	W
Coarse and fine aggregate[5]	208	833
Other construction materials[6]	615	5,570
Agricultural[7]	(8)	(8)
Chemical and metallurgical[9]	(8)	(8)
Special[10]	(8)	(8)
Other miscellaneous uses	800	11,300
Unspecified:[11]		
Actual	648	2,660
Estimated	35	203
Total	2,310	20,600

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Production reported in District 2 was included with "District 1" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes concrete aggregate (coarse).
[4]Includes stone sand (concrete) and screening (undesignated).
[5]Includes graded road base or subbase.
[6]Includes waste material.
[7]Includes poultry grit and mineral food and other agricultural uses.
[8]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."
[9]Includes dead-burned dolomite manufacture, lime manufacture, and sulfur oxide removal.
[10]Includes mine dusting or acid water treatment.
[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

NEVADA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,370	$27,200	$6.22
Plaster and gunite sands	420	1,530	3.63
Concrete products (blocks, brick, pipe, decorative, etc.)	334	1,350	4.03
Asphaltic concrete aggregates and other bituminous mixtures	3,140	16,400	5.23
Road base and coverings[2]	5,160	19,300	3.73
Fill	1,040	3,170	3.05
Other	28	149	5.32
Unspecified:[3]			
Actual	6,490	29,800	4.60
Estimated	1,680	6,870	4.09
Total or average	22,700	106,000	4.67

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime), and snow and ice control.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

NEVADA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

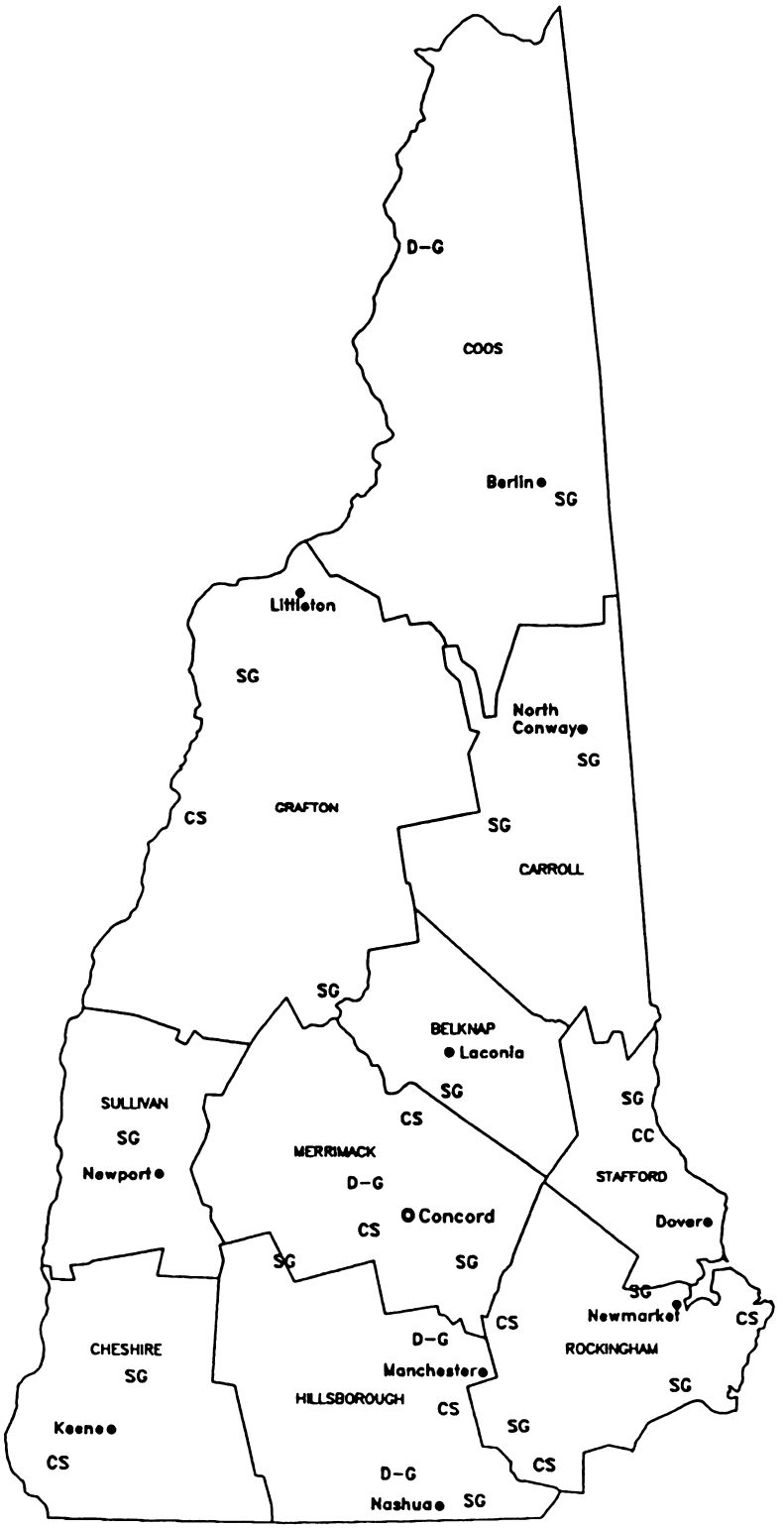
(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,530	7,600	3,600	22,500
Asphaltic/bituminous mixtures	903	6,820	[3]2,240	[3]9,620
Road base and coverings[4]	1,260	5,640	[3]3,900	[3]13,600
Fill	480	1,430	559	1,740
Other miscellaneous uses	28	149	—	—
Unspecified:[5]				
Actual	—	—	6,490	29,800
Estimated	645	2,270	1,040	4,600
Total	4,850	23,900	[3]17,800	[3]81,900

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes unspecified within all districts.
[4]Includes road and other stabilization (cement and lime), and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEW HAMPSHIRE



LEGEND

State boundary

County boundary

Capital

City

MINERAL SYMBOLS

CC Common Clay

CS Crushed Stone

D-G Dimension Granite

SG Sand and Gravel

0 20 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NEW HAMPSHIRE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the New Hampshire Department of Environmental Services for collecting information on all nonfuel minerals.

In 1995, New Hampshire ranked 47th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $36 million. Construction sand and gravel, a high-volume, low-value mineral commodity, was New Hampshire's leading nonfuel mineral commodity, accounting for about two-thirds of the State's nonfuel mineral production value. Crushed stone was the State's second leading nonfuel mineral. The dollar value totals for 1994 and 1995, as represented in table 1, are artificially low because data have been withheld to avoid disclosing company proprietary data. New Hampshire's ranking, however, was not affected by the withholding of data in either year. The actual decrease in the State's nonfuel mineral value in 1995 is substantially less than shown in table 1. The major portion of the 1995 decrease resulted from a drop in construction sand and gravel production and value. Compared with 1994, the value of crushed stone ncreased in 1995. Other nonfuel mineral commodities that decreased in value were dimension stone and gemstones.

Unlike 1995, the withheld value for 1994 was small in magnitude. Based on final data, the State's nonfuel mineral production value in 1994 (excluding the withheld value) increased by almost 25% from that of 1993. A significant increase in construction sand and gravel production boosted New Hampshire's mineral economy in 1994.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for construction sand and gravel and crushed stone are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEW HAMPSHIRE[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	3	$16	3	$16	3	$16
Gemstones		NA	9	NA	21	NA	17
Sand and gravel (construction)	thousand metric tons	[e]4,800	[e]20,700	7,120	32,600	5,600	25,700
Stone:							
Crushed	do.	1,390	7,790	[3]1,390	[3]7,470	[3]1,800	[3]9,900
Dimension	metric tons	53,100	8,670	35,300	6,300	W	W
Combined value of other industrial minerals		XX	—	XX	(4)	XX	(4)
Total		XX	37,200	XX	[5]46,400	XX	[5]35,600

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; kind and value included with "Combined value" data.

[4]Value excluded to avoid disclosing company proprietary data.

[5]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

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TABLE 2

NEW HAMPSHIRE: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate, graded: Concrete aggregate, coarse[3]	738	$5,750	$7.79
Agricultural: Poultry grit and mineral food	(4)	(4)	7.83
Unspecified:[5]			
Actual	(4)	(4)	2.63
Estimated	199	543	2.73
Total	1,390	7,470	5.39

[1]Includes granite, miscellaneous stone, and traprock; excludes limestone from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes bituminous aggregate (coarse), filter stone, graded road base or subbase, macadam, railroad ballast, riprap and jetty stone, stone sand (bituminous mix or seal), stone sand (concrete), and unpaved road surfacing.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

NEW HAMPSHIRE: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	1	W	W	$7.06	(2)	(2)	(2)	(2)
Granite	2	W	W	6.90	5	1,060	$5,070	$4.77
Traprock	7	937	$4,670	4.98	6	323	2,400	7.44
Miscellaneous stone	1	W	W	6.98	—	—	—	—
Total	XX	1,390	7,790	5.61	XX	1,380	7,470	5.39

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes limestone from State total to avoid disclosing company proprietary data.

TABLE 4

NEW HAMPSHIRE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

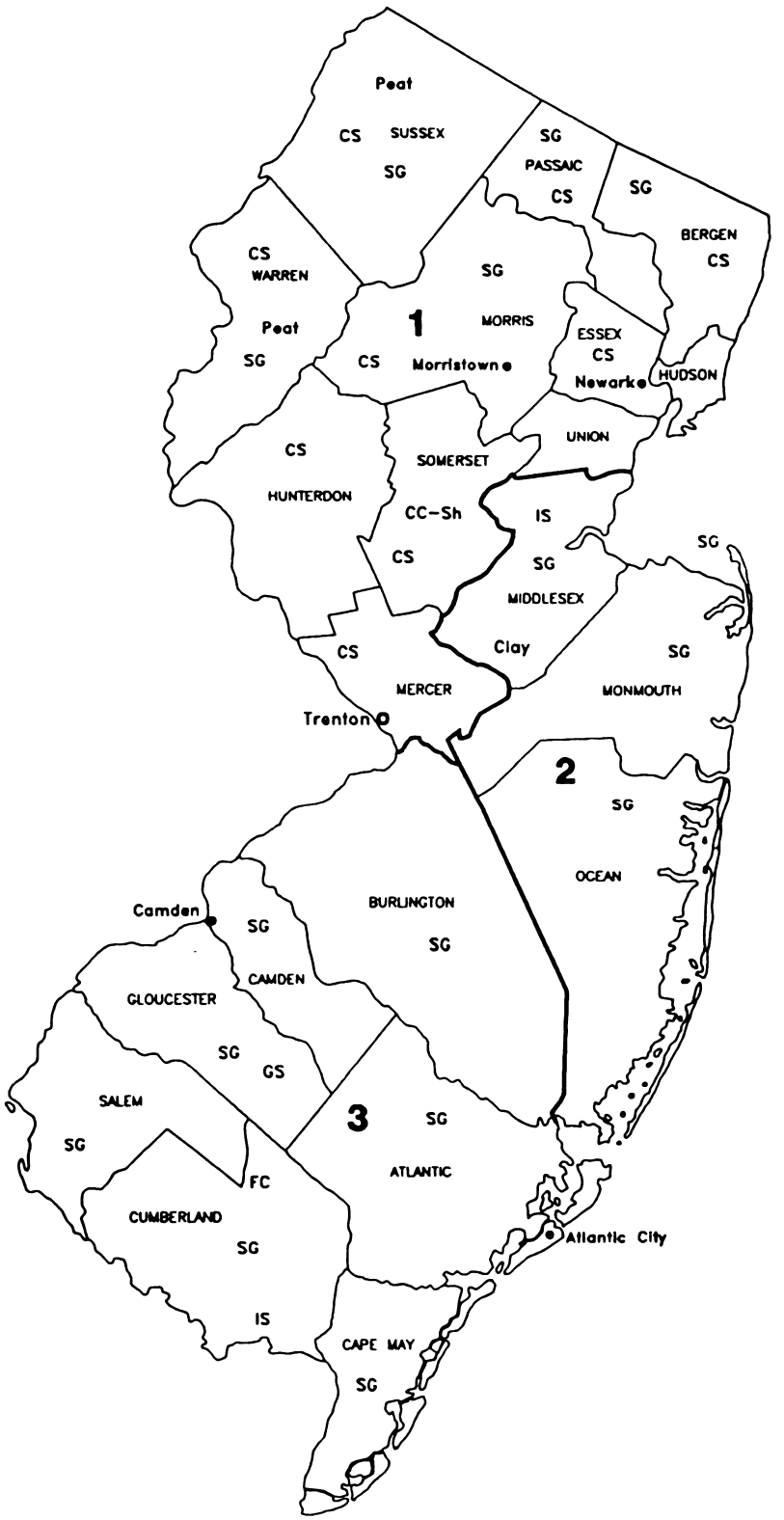
Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	602	$3,610	$5.99
Asphaltic concrete aggregates and other bituminous mixtures	318	1,740	5.47
Road base and coverings	601	2,820	4.70
Fill	989	2,390	2.42
Snow and ice control	162	581	3.59
Other[3]	2,150	9,680	4.51
Unspecified:[4]			
Actual	212	1,100	5.17
Estimated	2,090	10,700	5.10
Total or average	7,120	32,600	4.58

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes filtration and railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEW JERSEY



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

CC-Sh	Common Clay & Shale
Clay	Clay
CS	Crushed Stone
FC	Fire Clay
GS	Greensand
IS	Industrial Sand
Peat	Peat
SG	Sand and Gravel

0 20 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NEW JERSEY

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the New Jersey Geological Survey, New Jersey Department of Environmental Protection & Energy, Division of Science and Research, for collecting information on all nonfuel minerals.

In 1995, for the 4th time in the past 6 years, New Jersey ranked 37th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $289 million, virtually unchanged from that of 1994. This followed a 10.2% increase from 1993 to 1994 (based on final data). The State accounted for a little less than 1% of the U.S. total nonfuel mineral production value.

Crushed stone and construction sand and gravel, by value, were New Jersey's leading nonfuel mineral commodities. Decreases in value occurred for all nonfuel mineral commodities except crushed stone in 1995. In 1994, increases in construction sand and gravel and crushed stone provided most of the year's increased value.

Based on USGS estimates of the quantities produced in the 50 States in 1995, New Jersey remained the only producer of greensand marl. The State rose from fourth to third in the production of industrial sand and gravel and was eighth in peat. Greensand is used as a water softening, filtration medium to remove soluble iron and manganese from well water and as an organic conditioner for soils. In addition, New Jersey's mines produced significant quantities of crushed stone and construction sand and gravel.

The New Jersey Geological Survey[2] reported that large-scale capital projects contributed up to 5% of the improved performance level for the construction sector. The largest of these projects were in Atlantic City and at McGuire Air Force Base (AFB) in New Hanover Township, Burlington County. Atlantic City projects included construction of two new casinos, a large parking garage, a new convention center, and airport improvements.

In April, Clayton Concrete Co. constructed a state-of-the-art central mix concrete plant. This was in preparation for the expected demand from major construction projects planned for McGuire AFB; these projects commenced in September. Additionally, the adjacent U.S. Army facility at Fort Dix was planning major expansion projects during the next few years.

Strong transportation project activity in 1995, estimated at $718 million, and substantial funding increases planned for the next 2 years have also helped avert recent declines in the construction sector. Combined public agency and private sector construction activity during the year was estimated at $5.9 billion.

The Amboy Aggregates Joint Venture Co., of South Amboy, Middlesex County, has entered into a

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEW JERSEY[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$1	NA	$1	NA	$1
Sand and gravel:							
Construction	thousand metric tons	e14,700	e80,100	16,100	100,000	15,000	93,700
Industrial	metric tons	1,830,000	28,600	1,690,000	30,600	1,710,000	30,100
Stone (crushed)	thousand metric tons	[3]16,700	[3]138,000	19,800	154,000	20,600	163,000
Combined value of clays [common, fire (1993)], greensand marl, peat, and stone [crushed sandstone and miscellaneous (1993)]		XX	15,700	XX	4,460	XX	2,960
Total		XX	262,000	XX	289,000	XX	289,000

eEstimated. pPreliminary. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; value included with "Combined value" data.

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maintenance dredging contract with the State for the Sandy Hook Channel in Raritan Bay. Under this contract, the company will extract and sell 76,000 cubic meters (100,000 cubic yards) of construction sand and gravel. Amboy, the only company actively mining for sand and gravel in New Jersey coastal waters, has been dredging New Jersey waters since 1985.

Heavy mineral placer mining activity remained inactive during 1995; no new mining operations were being planned. New Jersey's exploration activity was mostly limited to the search for beach replenishment sand in the Atlantic coastal waters. The U.S. Army Corps of Engineers is involved with the New Jersey Department of Environmental Protection in several beach replenishment projects, including a large-scale replenishment of Monmouth County beaches, between Monmouth Beach and Sandy Hook.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Crushed stone and construction sand and gravel estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the New Jersey Geological Survey.

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TABLE 2

NEW JERSEY: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	167	$755	$4.52
Riprap and jetty stone	344	2,230	6.49
Filter stone	282	1,730	6.13
Other coarse aggregate	171	1,250	7.31
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,190	22,900	7.20
Bituminous aggregate, coarse	1,320	10,800	8.22
Bituminous surface-treatment aggregate	960	8,470	8.83
Railroad ballast	241	2,040	8.46
Other graded coarse aggregate	833	4,630	5.56
Fine aggregate (-3/8 inch):			
Stone sand, concrete	759	7,390	9.74
Stone sand, bituminous mix or seal	W	W	7.72
Screening, undesignated	1,520	9,050	5.96
Other fine aggregate	63	416	6.60
Coarse and fine aggregates:			
Graded road base or subbase	2,090	12,400	5.94
Unpaved road surfacing	10	66	6.60
Terrazzo and exposed aggregate	W	W	21.40
Crusher run or fill or waste	518	3,970	7.65
Other coarse and fine aggregates	W	W	7.07
Other construction materials[3]	3,640	27,200	7.48
Agricultural:			
Agricultural limestone	(4)	(4)	17.60
Poultry grit and mineral food	(4)	(4)	33.10
Chemical and metallurgical: Flux stone	(4)	(4)	15.90
Special:			
Asphalt fillers or extenders	(4)	(4)	15.00
Other fillers or extenders	(4)	(4)	18.90
Unspecified:[5]			
Actual	995	11,000	11.00
Estimated	2,540	25,700	10.10
Total	19,800	154,000	7.80

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes granite, limestone, miscellaneous stone, sandstone, and traprock.
[2]Data are rounded to three significant digits.
[3]Includes roofing granules.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
NEW JERSEY: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	(2)	(2)	(2)	(2)	1	W	W	$13.30
Granite	10	7,970	$66,900	$8.40	9	7,460	$58,200	7.81
Traprock	9	8,740	70,900	8.12	9	10,600	78,600	7.39
Sandstone	(2)	(2)	(2)	(2)	1	W	W	10.00
Miscellaneous stone	—	—	—	—	1	W	W	8.79
Total	XX	16,700	138,000	8.25	XX	19,800	154,000	7.80

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.
[2]Excludes limestone and sandstone from State total to avoid disclosing company proprietary data.

TABLE 4
NEW JERSEY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	6,140	$36,300	$5.92
Plaster and gunite sands	437	2,910	6.65
Concrete products (blocks, brick, pipe, decorative, etc.)	136	1,430	10.50
Asphaltic concrete aggregates and other bituminous mixtures	1,710	10,000	5.85
Road base and coverings[2]	666	3,750	5.62
Fill	699	3,080	4.40
Snow and ice control	193	1,260	6.53
Filtration	225	1,630	7.26
Unspecified:[3]			
Actual	4,360	30,500	7.00
Estimated	1,510	9,050	5.99
Total or average	16,100	100,000	6.21

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

NEW JERSEY: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

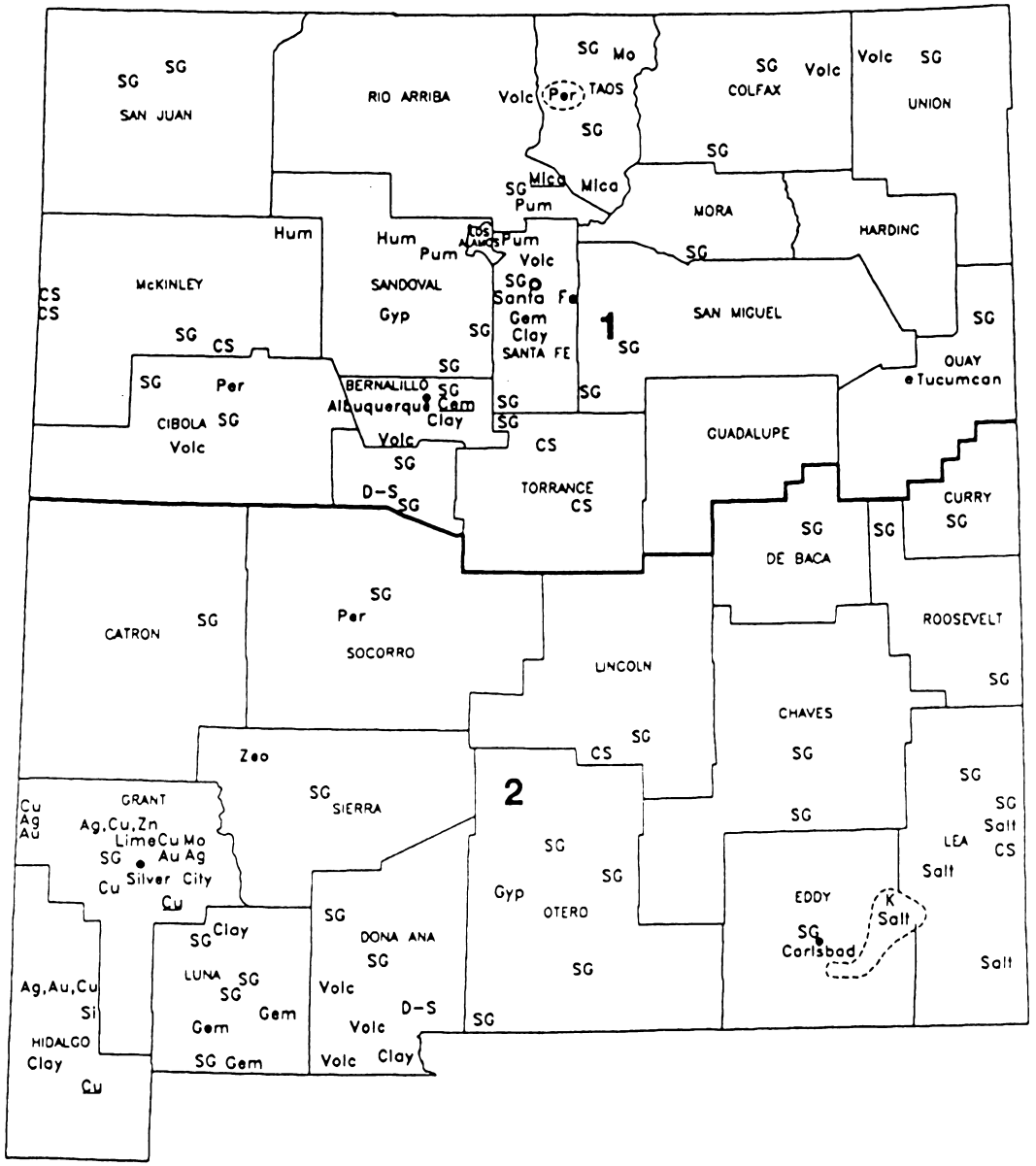
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,900	12,500	2,540	16,400	2,280	11,800
Asphaltic concrete aggregates and road base materials[3]	810	4,480	1,170	7,540	1,100	4,800
Snow and ice control	123	774	45	355	24	132
Other miscellaneous uses	196	1,460	29	180	—	—
Unspecified:[4]						
Actual	—	—	1,380	7,450	2,990	23,100
Estimated	139	1,070	376	1,740	996	6,230
Total	3,170	20,300	5,540	33,700	7,380	46,000

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, road, and other stabilization (cement).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEW MEXICO



LEGEND

- State boundary
- County boundary
- O Capital
- • City
- 1 —— Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Au	Gold
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
Cu	Copper
Cu	Copper plant
D-S	Dimension Stone
Gem	Gemstones
Gyp	Gypsum
Hum	Humate
K	Potash
Lime	Limestone
Mica	Mica
Mica	Mica plant
Mo	Molybdenum
Per	Perlite
Pum	Pumice
Salt	Salt
SG	Sand and Gravel
Si	Silica
Volc	Volcanic cinder
Zeo	Zeolites
Zn	Zinc
	Concentration of mineral operations

0 100 Kilometers

Principal Mineral-Producing Localities

THE MINERAL INDUSTRY OF NEW MEXICO

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the New Mexico Bureau of Mines and Mineral Resources for collecting information on all nonfuel minerals.

New Mexico ranked 11th among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State was 12th in 1994. The estimated value for 1995 was close to $1.1 billion, a 16% or $150 million increase from that of 1994. This increase followed a 15.7% increase from 1993 to 1994. The State accounted for about 3% of the U.S. total nonfuel mineral production value.

Substantial increases in copper value, owing to increased production and a sharp rise in the price of copper, accounted for the large majority of New Mexico's increased nonfuel mineral production value in 1994 and 1995. Based on value, copper and potash were, by a significant margin, the top nonfuel minerals mined in the State of New Mexico. The value for the two accounted for 86% of the State's total nonfuel mineral value and was equal to 16 times the value of the State's next highest mineral commodity, construction sand and gravel. In 1995, potash value had a significant drop (see table 1), but this was small in comparison to the increase in copper. An increase in construction sand and gravel value also contributed to the year's increase. All other nonfuel mineral commodities increased in value, except for gold, salt, masonry cement, and fire clays, for which there were only small decreases.

Based on USGS estimates of the quantities produced in the 50 States during 1995, New Mexico continued to lead the Nation in potash, perlite, and zeolites. The State also remained second in pumice and crude mica production, third in copper, sixth in molybdenum, and ninth in silver. In addition, significant quantities of construction sand and gravel and crude gypsum were mined in the State.

According to the New Mexico Bureau of Mines

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEW MEXICO[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	33	$101	127	$269	127	$269
Copper[4]	metric tons	224,000	453,000	234,000	574,000	240,000	725,000
Gemstones		NA	10	NA	14	NA	22
Gold[4]	kilograms	995	11,600	W	W	W	W
Potash (K_2O)	thousand metric tons	1,190	216,000	r2,450	r219,000	1,090	200,000
Pumice and pumicite	metric tons	W	W	129,000	1,050	W	W
Sand and gravel (construction)	thousand metric tons	e11,100	e51,100	10,400	47,400	12,300	57,800
Silver[4]	metric tons	22	3,090	22	3,750	22	3,810
Stone (crushed)[5]	thousand metric tons	r3,580	r19,000	3,550	20,000	3,800	21,800
Combined value of cement, clays (fire), gypsum (crude), iron ore (usable), mica (crude), perlite (crude), pumice and pumicite (1993,1995), salt, stone [crushed quartzite (1993), crushed quartzite and traprock (1994-95), dimension (1993, 1995), dimension granite, marble, and miscellaneous (1994)], and values indicated by symbol W		XX	51,200	XX	r65,100	XX	69,800
Total		XX	r805,000	XX	r930,000	XX	1,080,000

eEstimated. pPreliminary. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; value included with "Combined value" data.
[4]Recoverable content of ores, etc.
[5]Excludes certain stones; value included with "Combined value" data.

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and Mineral Resources[2] (BMMR), the State's copper industry thrived in 1995. Phelps Dodge Co. operated two copper mines and two copper smelters in New Mexico. The company's Chino Mine, the largest porphyry-copper deposit in New Mexico, contains copper sulfides and has been in operation since 1911. According to the company's annual report, the Chino Mine produced a record 153,000 metric tons[3] of copper in 1995. This included a record 61,800 tons of electrowon copper from leachate solution, the other 91,200 tons coming from electrolytic copper from concentrate. During the first quarter of 1995, Chino completed a $16 million construction project to improve ore grinding and copper recovery at the concentrator. At yearend, the company reported reserves at Chino of 270 million tons of milling ore grading 0.67% copper and 600 million tons of oxide ore grading 0.24% copper. At the associated Hurley Smelter, a $5 million investment in emissions gas treatment facilities for the flash furnace resulted in lower maintenance costs and a record amount of sulfur capture. At the Tyrone Mine, Phelps Dodge produced almost 64,000 tons of electrowon copper from the open-pit mining and leaching of oxide ore. Reserves at Tyrone were anticipated to be exhausted by the year 2000. The company's Hidalgo smelter in Playas produced a record high 224,000 tons of anode copper from domestic concentrates and from Phelps Dodge's Chilean operations.

Biron Bay Resources Ltd. of Toronto Canada, after announcing a gold-silver discovery along the northwest-trending East Camp-Summit fault several years ago, was planning the development of the property. The company reported the ore deposit to be 1.32 million tons (1.45 million short tons) containing 6.2-grams-per-ton (0.18-troy-ounce-per-short-ton) of gold and 350-grams-per-ton (10.3-ounces-per-short-ton) of silver. Biron plans to complete development and start mining in the next few years.

Addwest Minerals, Inc. has begun development of the Wind Mountain for nepheline syenite in southern Otero County for use as a constituent in amber-colored beverage containers, ceramics, and flatglass. The nepheline syenite contains high iron compared to other commercial sources of nepheline syenite. The magnetic fraction can be sold as millite, an iron-rich additive required for controlling the color of glass. Several other consumers have tested the nepheline syenite and found it suitable for use in ceramics, fiberglass, and flatglass. The lack of free silica as quartz also enables use of the Wind Mountain nepheline syenite as a silica-free abrasive. Interesting textural variations in the main mass of the syenite, having wisps of finer grained material "waving" through the rock, make it an attractive building stone. Mining will be underground, room and pillar method. At full production, according to a BMMR report, Wind Mountain is expected to process 2,700 tons per day (3,000 short tons) or 635,000 tons per year (700,000 short tons). Current proven, probable, and inferred reserves total 180 million tons (200 million short tons) for a mine life of more than 100 years. An adit was started in 1995. However, the project was on hold at yearend.

Alta Gold Co. applied for mining permits to reopen its Copper Flat Mine, which contains recoverable copper, gold, molybdenum, and silver. The company worked on preparing an environmental impact statement (EIS) (draft released February 1996). Alta hopes to open the mine in 1996 or 1997. Minable reserves were estimated in 1984 at 54 million tons (60 million short tons) of 0.42% copper and 0.012% molybdenum.

The Bureau of Land Management ruled that Cobre Mining Co. needed to complete an EIS before expanding the Continental Mine (copper) in the Fierro-Hanover district and developing its copper deposit at Hanover Mountain. The EIS was scheduled for completion in September 1996, which would allow for the expansion and new development to begin in 1997.

Copar Pumice Co. delayed the opening of its El Cajete pumice mine in the Jemez Mountains until preparation of an EIS (draft released early 1996). The mine was expected to open in 1996 and to operate for 10 years. Reserves were estimated at 91,000 tons (100,000 short tons) of pumice, which were to be used in making stone-washed jeans.

Cyprus Pinos Altos Corp. closed its Pinos Altos copper mine near Silver City, Grant County, in June 1995 because of depleted reserves. In addition, R&B Mining Co.'s Center Mine, a gold mine in the Steeple Rock district, closed in early 1995.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the New Mexico Bureau of Mines and Mineral Resources.

[3]All tons are metric tons unless otherwise specified.

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TABLE 2

NEW MEXICO: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	41	$268	$6.54
Other coarse aggregate	46	252	5.48
Coarse aggregate, graded:			
Concrete aggregate, coarse	283	1,260	4.45
Bituminous aggregate, coarse	128	920	7.19
Bituminous surface-treatment aggregate	96	285	2.97
Railroad ballast	W	W	7.72
Other graded coarse aggregate	W	W	3.15
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	4.34
Stone sand, bituminous mix or seal	W	W	1.29
Screening, undesignated	W	W	7.07
Other fine aggregate	61	385	6.31
Coarse and fine aggregates:			
Graded road base or subbase	300	852	2.84
Terrazzo and exposed aggregate	124	1,380	11.10
Crusher run or fill or waste	76	254	3.34
Other coarse and fine aggregates	(3)	1	5.64
Other construction materials[4]	731	4,970	6.79
Chemical and metallurgical: Cement manufacture	(3)	(3)	4.54
Unspecified:[6]			
Actual	(3)	(3)	4.31
Estimated	798	5,250	6.58
Total	3,550	20,000	5.62

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes granite, limestone, miscellaneous stone, sandstone, and volcanic cinder and scoria; excludes quartzite and traprock from State total to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Less than 1/2 unit.

[4]Includes roofing granules.

[5]Withheld to avoid disclosing company proprietary data; included in "Total."

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
NEW MEXICO: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r25	1,240	r$5,260	r$4.24	21	1,880	$8,660	$4.61
Granite	r12	1,510	r9,840	6.53	11	1,250	8,620	6.90
Traprock	1	168	371	2.21	(2)	(2)	(2)	(2)
Sandstone	1	101	112	1.11	4	1	5	5.00
Quartzite	1	W	W	7.77	(2)	(2)	(2)	(2)
Volcanic cinder and scoria	r10	r342	r2,190	r6.40	10	285	2,000	7.02
Miscellaneous stone	r2	W	W	r4.53	4	141	682	4.84
Total	XX	r3,500	r18,400	r5.31	XX	3,550	20,000	5.62

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes quartzite and traprock from State total to avoid disclosing company proprietary data.

TABLE 4
NEW MEXICO: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[2]	W	W	W	W
Coarse aggregate, graded[3]	W	W	W	W
Fine aggregate (-3/8 inch)[4]	W	W	W	W
Coarse and fine aggregate[5]	284	2,030	221	505
Other construction materials[6]	1,100	6,720	285	1,570
Chemical and metallurgical[7]	(8)	(8)	—	—
Unspecified[9]				
Actual	(8)	(8)	(8)	(8)
Estimated	(8)	(8)	(8)	(8)
Total	2,420	14,000	1,130	5,950

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes riprap and jetty stone and other coarse aggregate.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[5]Includes graded road base or subbase, terrazzo and exposed aggregate, crusher run (select material or fill), and other coarse and fine aggregates.
[6]Includes roofing granules.
[7]Includes cement manufacture.
[8]Withheld to avoid disclosing company proprietary data; included in "Total."
[9]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

NEW MEXICO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	1,530	$9,120	$5.98
Plaster and gunite sands	139	846	6.09
Asphaltic concrete aggregates and other bituminous mixtures	1,380	7,130	5.18
Road base and coverings	2,290	8,860	3.87
Fill	426	988	2.32
Other	109	317	2.91
Unspecified:[2]			
Actual	2,400	10,800	4.51
Estimated	2,160	9,290	4.30
Total or average	10,400	47,400	4.54

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

NEW MEXICO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

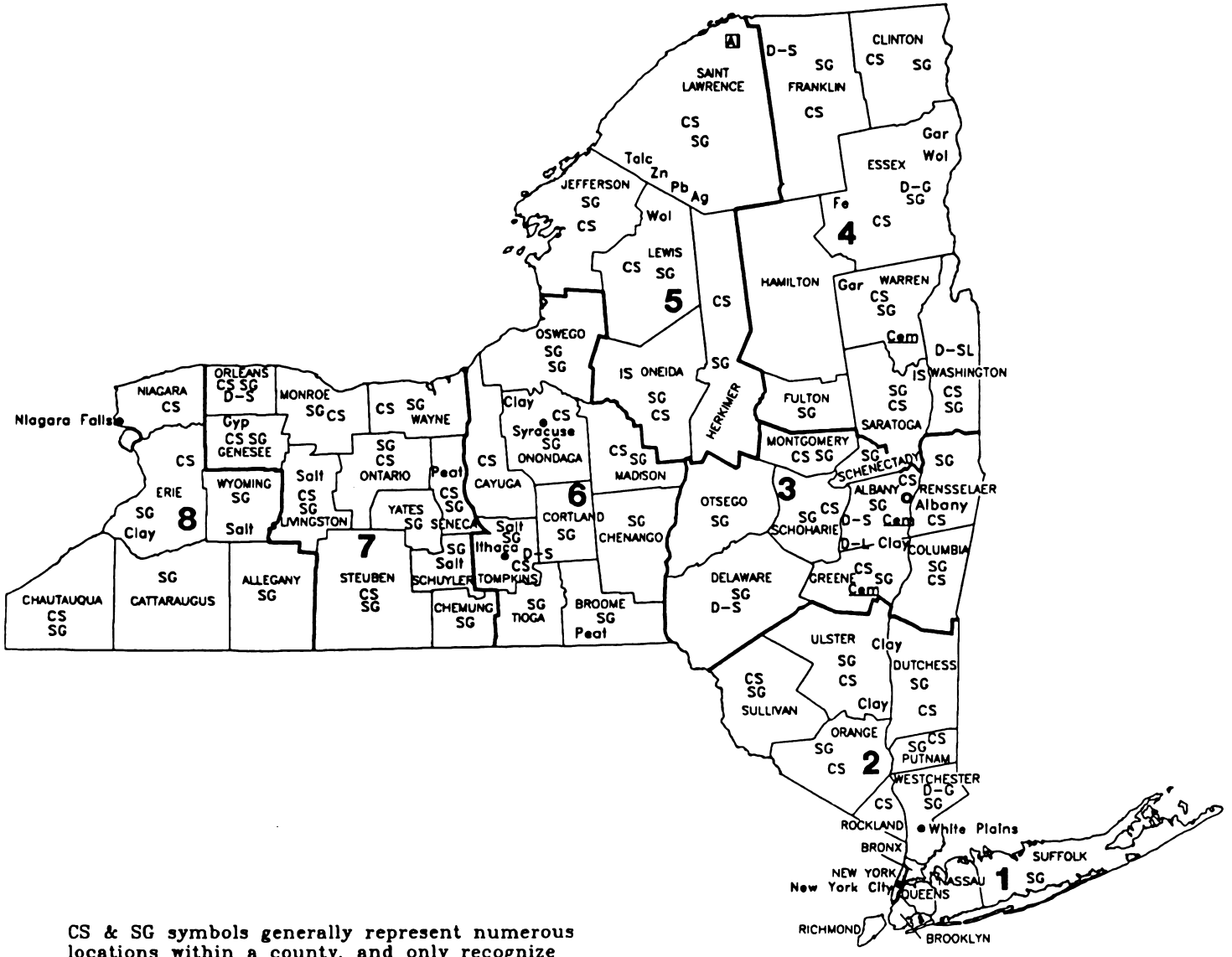
(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	872	5,110	652	4,020
Plaster and gunite sands	114	684	25	162
Asphaltic concrete aggregates and road base materials	839	4,310	538	2,830
Road base and coverings	1,110	4,180	1,180	4,680
Fill	173	385	253	603
Other miscellaneous uses	18	40	91	277
Unspecified:[2]				
Actual	2,400	10,800	—	—
Estimated	1,570	7,510	593	1,780
Total	7,100	33,100	3,330	14,300

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NEW YORK



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
A	Aluminum plant
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-G	Dimension Granite
D-L	Dimension Limestone
D-S	Dimension Sandstone
D-SL	Dimension Slate
Fe	Iron
Gar	Garnet
Gyp	Gypsum
IS	Industrial sand
Pb	Lead
Peat	Peat
Salt	Salt
SG	Sand and Gravel
Talc	Talc minerals
Wol	Wollastonite
Zn	Zinc

0 50 Kilometers

CS & SG symbols generally represent numerous locations within a county, and only recognize the existence of that industry and not a specific location.

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NEW YORK

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the New York Education Department, New York Geological Survey, for collecting information on all nonfuel minerals.

New York ranked 15th in the Nation in nonfuel mineral production value[1] in 1995, down from 13th in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $820 million, an 8% decrease from that of 1994. This followed a nearly 5% increase from 1993 to 1994 (based on final data). The State accounted for more than 2% of the U.S. total nonfuel mineral production value.

In 1995, crushed stone replaced salt as New York's leading nonfuel mineral, based on value. About 90% of the State's nonfuel mineral production value came from industrial minerals and mineral products, primarily crushed stone, salt, construction sand and gravel, portland cement, and wollastonite. Zinc accounted for most of the metal production and value. In 1995, the State's overall decrease in nonfuel mineral value, mostly in salt, crushed stone, portland cement, and construction sand and gravel, was mitigated to a small degree by increases in zinc and common clays. By contrast, in 1994, the values for most mineral commodities increased with the exception of construction sand and gravel and portland cement. Compared with Compared with 1994, other nonfuel minerals that increased in value in 1995 were as follows: dimension stone, masonry cement, industrial sand and gravel, and gemstones. Decreases occurred in talc and pyrophyllite, garnet, crude gypsum, lead, and peat.

Based on USGS estimates of quantities produced in the 50 States in 1995, New York remained the only State to produce wollastonite, second of two garnet-producing States, third in salt and zinc, fourth in talc and pyrophyllite, and sixth in lead. While the State remained 10th in dimension stone, it dropped from 8th to 10th place in portland cement. Additionally, New York mines and plants continued to produce significant quantities of crushed stone, construction sand and gravel, common clays, and masonry cement.

The New York State Geological Survey[2] reported

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NEW YORK[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	75,300	$5,420	82,000	$6,020	111,000	$8,170
Portland	do.	2,970,000	149,000	2,650,000	139,000	2,380,000	125,000
Clays	thousand metric tons	508	9,250	507	9,270	572	12,800
Peat	metric tons	W	W	[r]W	12	W	W
Salt	thousand metric tons	5,620	191,000	[r]6,060	[r]233,000	4,990	190,000
Sand and gravel (construction)	do.	[e]34,900	[e]162,000	28,000	138,000	26,800	134,000
Stone:							
Crushed	do.	38,400	[3]223,000	39,400	239,000	36,500	219,000
Dimension	metric tons	19,300	3,440	[3]24,600	[3]7,370	36,300	8,830
Combined value of emery (1993), garnet (abrasive), gemstones, gypsum (crude), lead, sand and gravel (industrial), silver, stone [crushed traprock (1993), dimension granite and quartzite (1994)], talc and pyrophyllite, wollastonite, zinc, and values indicated by symbol W		XX	108,000	XX	[r]121,000	XX	122,000
Total		XX	852,000	XX	[r]892,000	XX	820,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; value included with "Combined value" data.

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that the Division of Mineral Resources of the New York Department of Environmental Conservation (NYDEC) issued 342 mining permits in 1995, of which 130 were for new permits and 212 were for renewals. There were 2,560 active mines during the year, of which 71% were industry-owned and the remainder were State-owned. Roughly 25% of total acres disturbed by mining were reclaimed.

The New York State Court of Appeals unanimously approved a town's authority to enact a zoning ordinance to eliminate mining as a permitted use throughout the town. Initially, the Appellate Division ruled that a town could not completely ban mining. The decision by the Court of Appeals could have a major impact upon the mining industry in New York if municipalities amend zoning laws to prohibit mining.

The NYDEC issued a permit to Akzo-Nobel Salt, Inc. to construct a new underground salt mine at Hamptons Corners, NY. Protect a Clean Environment, Inc. (PACE) and the League of Women Voters of Livingston County protested the permit because of groundwater and mine design concerns and requested a legal hearing.

Officials from the New York State Department of Conservation, Division of Mineral Resources and Division of Solid Waste met with staff of Zinc Corporation of America (ZCA) to discuss the potential for a research, development, and demonstration permit to allow the use of coal ash as supporting fill in underground hard rock mines. ZCA hopes the project will demonstrate that coal ash can reduce the need for landfill space, be used safely to fill voids below groundwater level, and provide adequate structural strength at relatively low cost.

Mining continued at a record pace in Akzo-Nobel's flooded salt mine at Retsof in Livingston County. By the end of the year, approximately 2.1 million metric tons (2.3 million short tons) of salt were stockpiled. Continued flooding caused the mine to be abandoned in September; by December the mine was completely flooded. Mine closure was orderly and carried out in an environmentally sound manner. All fluids were drained from equipment to be abandoned in the mine and shipped off site for disposal. All mine shafts were filled and capped. At the end of 1995, plans and permit applications for a new rock salt mine located several miles southeast of the Retsof Mine were forwarded. Plans for the new mine called for ground breaking in late spring of 1996.

As a result of the interest generated in underground mining in New York by the collapse of a portion of the Akzo-Nobel salt mine, legislative attention was focused on the industry. An Assemblyman representing Manhattan in New York City, the chair of the Assembly Environmental Committee, held public hearings on the underground mining industry in order to determine if further regulation of the industry was warranted. Representatives of most of the underground mines in the State, interested citizens' groups, and individuals were called to testify.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the New York State Geological Survey.

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TABLE 2

NEW YORK: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	115	$1,090	$9.51
Riprap and jetty stone	602	4,370	7.26
Filter stone	90	684	7.60
Other coarse aggregate	272	2,040	7.49
Coarse aggregate, graded:			
Concrete aggregate, coarse	2,620	19,600	7.49
Bituminous aggregate, coarse	8,520	55,300	6.50
Bituminous surface-treatment aggregate	668	4,210	6.30
Railroad ballast	115	686	5.97
Other graded coarse aggregate	722	6,140	6.56
Fine aggregate (-3/8 inch):			
Stone sand, concrete	193	1,310	6.77
Stone sand, bituminous mix or seal	2,320	16,600	7.16
Screening, undesignated	999	4,950	4.95
Other fine aggregate	467	4,260	9.13
Coarse and fine aggregates:			
Graded road base or subbase	6,500	35,900	5.53
Unpaved road surfacing	99	649	6.56
Terrazzo and exposed aggregate	4	179	44.80
Crusher run or fill or waste	4,650	19,200	4.12
Other coarse and fine aggregates	693	4,120	5.49
Other construction materials	326	2,250	6.91
Agricultural: Agricultural limestone	99	912	8.66
Chemical and metallurgical:			
Cement manufacture	4,150	16,200	3.91
Lime manufacture	49	1,080	6.07
Special: Other fillers or extenders[3]	40	397	9.93
Unspecified:[4]			
Actual	232	1,390	6.01
Estimated	4,910	35,100	7.15
Total	39,400	239,000	6.05

[1]Includes dolomite, granite, limestone, limestone-dolomite, marble, sandstone, slate, and traprock.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes asphalt fillers or extenders.

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

NEW YORK: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r68	r27,600	r$149,000	r$5.38	67	27,400	$132,000	$4.80
Dolomite	13	r7,350	r55,700	r7.58	13	7,540	55,800	7.41
Marble	1	75	2,420	32.30	1	87	1,610	18.50
Granite	9	1,440	9,100	6.34	11	2,430	20,400	8.37
Traprock	2	W	(3)	(3)	2	W	W	11.30
Sandstone	r6	W	W	r7.13	8	798	5,420	6.79
Slate	—	—	—	—	1	W	W	10.80
Miscellaneous stone	2	W	W	W	—	—	—	—
Total	XX	38,400	223,000	5.81	XX	39,400	239,000	6.05

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes "Limestone - dolomite," reported with no distinction between the two.

[3]Excludes traprock value from State total to avoid disclosing company proprietary data.

TABLE 4

NEW YORK: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 3		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	252	2,760	240	1,660	60	384	W	W
Coarse aggregate, graded[4]	3,370	32,500	2,010	14,400	1,360	9,090	W	W
Fine aggregate (-3/8 inch)[5]	1,390	13,700	614	4,040	(6)	(6)	W	W
Coarse and fine aggregate[7]	837	8,120	1,230	7,200	756	5,100	W	W
Other construction materials	—	—	(6)	(6)	—	—	4,750	22,100
Agricultural[8]	—	—	(6)	(6)	(6)	(6)	(6)	(6)
Chemical and metallurgical[9]	—	—	(6)	(6)	(6)	(6)	(6)	(6)
Special[10]	—	—	—	—	—	—	40	397
Unspecified:[11]								
Actual	—	—	149	875	—	—	83	519
Estimated	1,690	15,700	186	1,630	18	194	60	451
Total	7,540	72,800	8,130	45,700	3,060	17,600	5,020	24,800

See footnotes at end of table.

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TABLE 4—Continued

NEW YORK: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 6		District 7		District 8	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	160	982	168	1,150	W	W
Coarse aggregate, graded[4]	1,320	6,250	(6)	(6)	W	W
Fine aggregate (-3/8 inch)[5]	769	3,550	774	3,790	—	—
Coarse and fine aggregate[7]	2,370	8,860	2,790	12,000	W	W
Other construction materials	(6)	(6)	—	—	2,520	14,500
Agricultural[8]	(6)	(6)	(6)	(6)	27	300
Chemical and metallurgical[9]	—	—	—	—	—	—
Special[10]	—	—	—	—	—	—
Unspecified:[11]						
Actual	—	—	—	—	—	—
Estimated	89	599	1,270	7,740	1,590	8,740
Total	4,770	20,900	6,800	33,400	4,140	23,500

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]There was no crushed stone produced in District 1.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Withheld to avoid disclosing company proprietary data; included in "Total."
[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[8]Includes agricultural limestone.
[9]Includes cement manufacture and lime manufacture.
[10]Includes asphalt fillers or extenders and other fillers or extenders.
[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

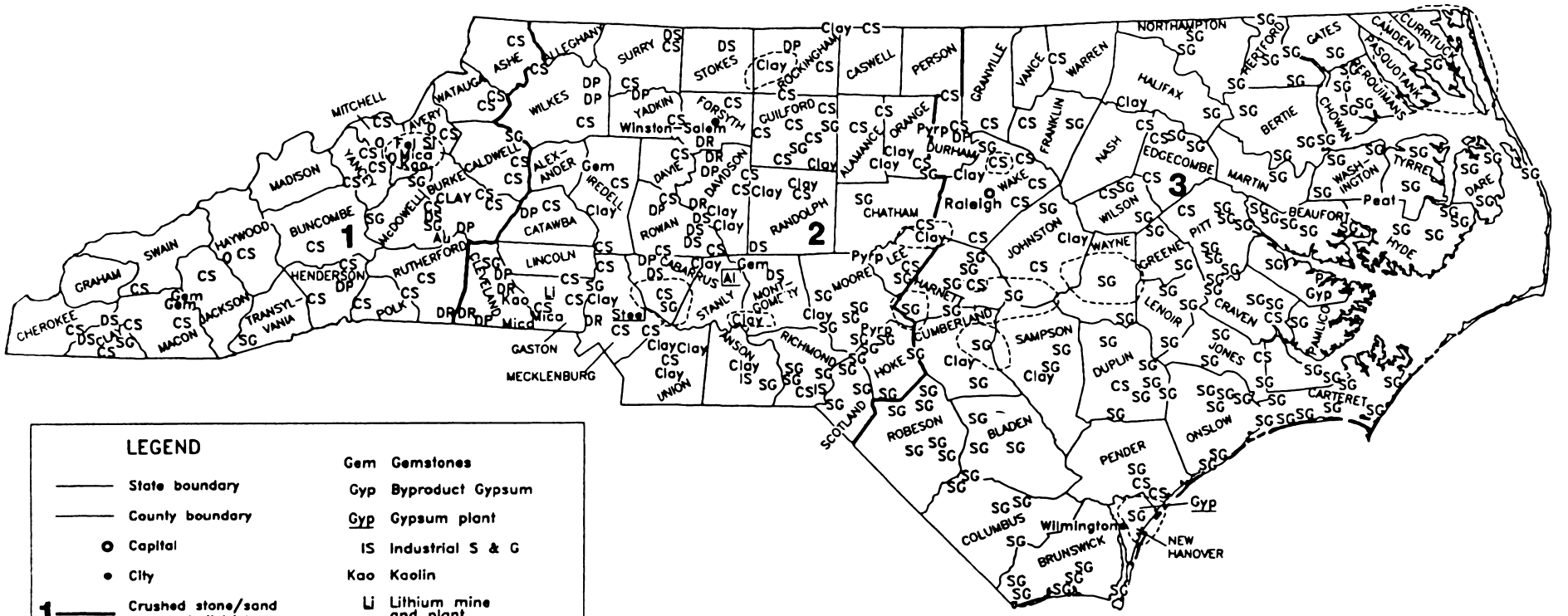
NEW YORK: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,380	$41,000	$5.55
Plaster and gunite sands	183	919	5.02
Concrete products (blocks, bricks, pipe, decorative, etc.)	327	2,170	6.63
Asphaltic concrete aggregates and other bituminous mixtures	2,850	15,000	5.29
Road base and coverings[2]	5,250	20,800	3.96
Fill	2,340	5,520	2.36
Snow and ice control	1,560	7,180	4.59
Railroad ballast	28	157	5.61
Filtration	54	513	9.50
Other	209	1,060	5.08
Unspecified:[3]			
Actual	2,740	13,700	5.02
Estimated	5,110	29,700	5.81
Total or average	28,000	138,000	4.92

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NORTH CAROLINA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

- Al — Aluminum plant
- Au — Gold
- Clay — Clay
- CS — Crushed Stone
- DR/DP — Dredged/Dipped sand & other surficial materials
- DS — Dimension Stone
- Fel — Feldspar
- Gem — Gemstones
- Gyp — Byproduct Gypsum
- Gyp — Gypsum plant
- IS — Industrial S & G
- Kao — Kaolin
- Li — Lithium mine and plant
- Mica — Mica
- O — Olivine
- P — Phosphate rock
- Peat — Peat
- Pyrp — Pyrophyllite
- SG — Sand and Gravel
- Si — Silica plant
- Steel — Iron and Steel plant
- Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NORTH CAROLINA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Division of Land Resources, North Carolina Department of Environment, Health, and Natural Resources, for collecting information all nonfuel minerals.

In 1995, for the fourth year in a row, North Carolina ranked 17th nationally in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $742 million, a 5% increase from that of 1994. This followed a gain of almost 15% from 1993 to 1994 (based on final data). The State accounted for 2% of the U.S. total nonfuel mineral production value.

The increased values of crushed stone and phosphate rock had the most impact on the changing values of the past 2 years. The value of crushed stone was up more than 8% in 1995, following an almost 18% gain in 1994. Phosphate rock value increased 11% in 1995, following an increase of more than 26% in 1994. Compared with 1994, the other mineral commodity values that increased in 1995 were as follows: feldspar, dimension stone, gemstones, and talc and pyrophyllite. Decreases occurred in lithium minerals, construction and industrial sand and gravel, common clays, crude mica, and olivine. In 1994, all commodities increased in value except for construction sand and gravel, which had a small decrease.

Compared with USGS estimates of the quantities produced in the other 49 States, North Carolina remained first in feldspar and crude mica; first of two States that produced lithium minerals and olivine; third in phosphate rock; fifth in talc and pyrophyllite; and seventh in industrial sand and gravel. While the State ranked sixth in peat production, it climbed from eighth to sixth in kaolin and dropped from first to fifth in common clays. North Carolina mines have been producers of industrial minerals exclusively since the early 1970's, particularly since the 1971 closing of the Tungsten Queen Mine, an underground tungsten mine

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NORTH CAROLINA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	2,380	$11,200	2,530	$12,500	2,250	$10,100
Feldspar	metric tons	472,000	16,700	488,000	17,600	483,000	17,700
Gemstones		NA	546	NA	565	NA	4,490
Mica (scrap)	thousand metric tons	51	2,700	68	3,270	68	3,220
Peat	metric tons	W	162	21,000	W	W	W
Sand and gravel:							
Construction	thousand metric tons	[e]11,100	[e]53,800	11,100	50,700	10,700	50,300
Industrial	metric tons	1,340,000	18,600	1,460,000	24,200	1,460,000	16,100
Stone:							
Crushed	thousand metric tons	[4]47,800	[4]298,000	[4]53,900	[4]351,000	57,200	380,000
Dimension	metric tons	31,700	12,300	[4]33,700	[4]12,500	46,300	14,100
Combined value of clays (kaolin), lithium minerals, olivine, phosphate rock, stone [crushed quartzite, sandstone, slate, and miscellaneous (1994), crushed quartzite, slate, and volcanic cinder (1993), dimension quartzite, sandstone, slate, and miscellaneous (1994)], talc and pyrophyllite, and values indicated by symbol W		XX	204,000	XX	[r]236,000	XX	246,000
Total		XX	617,000	XX	[r]709,000	XX	742,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; value included with "Combined value" data.

[4]Excludes certain stones; value included with "Combined value" data.

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in Vance County. However, significant exploration for gold has occurred during the past several years.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Estimates for some commodities, especially construction sand and gravel and crushed stone, are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 2
NORTH CAROLINA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	467	$2,320	$4.97
Riprap and jetty stone	557	4,450	7.98
Filter stone	384	2,590	6.74
Other coarse aggregate	W	W	5.65
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,690	26,200	7.10
Bituminous aggregate, coarse	2,320	17,500	7.57
Bituminous surface-treatment aggregate	320	2,170	6.79
Railroad ballast	1,320	6,250	4.72
Fine aggregate (-3/8 inch):			
Stone sand, concrete	152	685	4.51
Stone sand, bituminous mix or seal	407	2,130	5.22
Screening, undesignated	2,160	10,600	4.88
Other fine aggregate	W	W	8.43
Coarse and fine aggregates:			
Graded road base or subbase	8,030	42,400	5.27
Unpaved road surfacing	326	2,060	6.33
Terrazzo and exposed aggregate	W	W	22.00
Crusher run or fill or waste	923	5,020	5.44
Other coarse and fine aggregates	W	W	5.41
Other construction materials	1,260	8,970	7.11
Agricultural:			
Agricultural limestone	10	53	5.30
Poultry grit and mineral food	10	278	27.80
Other specified uses not listed	36	400	11.10
Unspecified:[3]			
Actual	30,600	210,000	6.88
Estimated	979	6,500	6.64
Total	53,900	351,000	6.51

W Withheld to avoid disclosing company proprietary data; included in "Other construction materials."
[1]Includes calcareous marl, dolomite, granite, limestone, miscellaneous stone, quartzite, slate, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

NORTH CAROLINA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	9	3,450	$23,600	$6.84	12	4,290	$30,000	$6.98
Dolomite	1	179	1,250	r7.01	1	245	1,680	6.87
Calcareous marl	3	60	257	4.28	3	111	738	6.65
Granite	70	r38,400	r236,000	r6.16	68	41,300	265,000	6.41
Trap rock	4	r3,930	r24,700	r6.29	7	3,930	25,800	6.57
Slate	(2)	(2)	(2)	(2)	3	W	W	6.95
Volcanic cinder and scoria	(2)	(2)	(2)	(2)	1	W	W	7.04
Quartzite	(2)	(2)	(2)	(2)	1	W	W	5.38
Miscellaneous stone	3	1,790	11,400	6.35	3	1,370	9,260	6.77
Total	XX	47,800	298,000	6.23	XX	53,900	351,000	6.51

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to three significant digits.

[2]Excludes quartzite, slate, and volcanic cinder and scoria from State total to avoid disclosing company proprietary data.

TABLE 4

NORTH CAROLINA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	W	W	W	W	680	3,500
Coarse aggregate, graded[3]	W	W	W	W	1,230	8,020
Fine aggregate (-3/8 inch)[4]	690	4,470	W	W	W	W
Coarse and fine aggregate[5]	3,000	17,400	W	W	W	W
Other construction materials	2,620	17,300	12,200	72,400	1,940	10,100
Agricultural[6]	10	53	10	278	—	—
Other miscellaneous uses[7]	36	400	—	—	—	—
Unspecified[8]						
Actual	2,370	14,900	17,200	117,000	11,000	78,500
Estimated	—	—	907	5,950	72	546
Total	8,720	54,600	30,300	196,000	14,900	101,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, and railroad ballast.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[6]Includes agricultural limestone, poultry grit, and mineral food.

[7]Includes other specified uses not listed.

[8]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	3,720	$13,800	$3.70
Plaster and gunite sands	55	206	3.75
Concrete products (blocks, brick, pipe, decorative, etc.)	879	2,440	2.77
Asphaltic concrete aggregates and other bituminous mixtures	772	2,290	2.97
Road base and coverings[2]	1,270	7,270	5.71
Fill	572	1,160	2.03
Railroad ballast	289	1,340	4.63
Other[3]	182	513	2.82
Unspecified:[4]			
Actual	2,730	19,700	7.22
Estimated	614	2,020	3.29
Total or average	11,100	50,700	4.57

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (lime) and snow and ice control.
[3]Includes filtration.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

NORTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

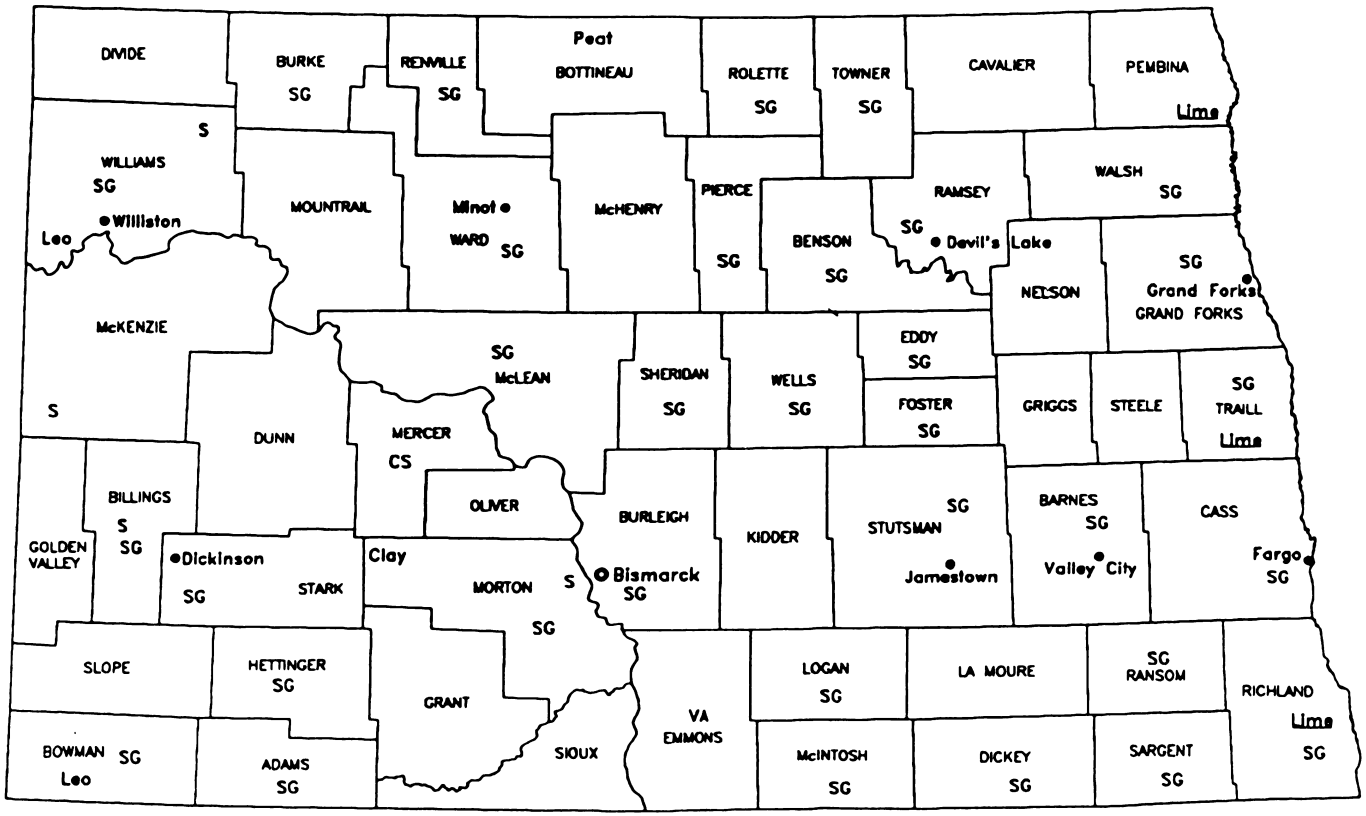
Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	349	2,240	1,850	5,950	2,460	8,210
Asphaltic concrete aggregates and road base materials[3]	645	3,600	596	3,870	1,380	3,250
Railroad ballast	289	1,340	—	—	—	—
Other miscellaneous uses[4]	—	—	110	243	71	271
Unspecified:[5]						
Actual	645	2,960	640	9,190	1,450	7,560
Estimated	29	62	311	1,050	274	906
Total	1,960	10,200	3,510	20,300	5,620	20,200

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, road and other stabilization (lime), and snow and ice control.
[4]Includes filtration.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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NORTH DAKOTA



LEGEND

- State boundary
- County boundary
- Capital
- City

MINERAL SYMBOLS

Clay	Clay
CS	Crushed Stone
Leo	Leonardite
Lime	Lime plant
Peat	Peat
S	Sulfur
SG	Sand and Gravel
VA	Volcanic Ash

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF NORTH DAKOTA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the North Dakota Geological Survey for collecting information on all nonfuel minerals.

In 1995, North Dakota ranked 49th in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $25 million, a 3% decrease from that of 1994. This followed a slight decrease from 1993 to 1994. The State accounted for about one-tenth of 1% of the U.S. total nonfuel mineral production value.

North Dakota's mine pits produced significant quantities of construction sand and gravel, the State's leading nonfuel mineral by value. This high-volume, low-value mineral commodity accounted for nearly 82% of the State's nonfuel mineral production value. Lime was the second principal nonfuel mineral commodity produced in the State. Although not included in USGS statistics, recovered elemental sulfur, based on value, was an important part of North Dakota's mineral economy. Elemental sulfur and other by-products (krypton, xenon, anhydrous ammonia, and liquid nitrogen) were recovered at fuel mineral operations, including facilities for the processing of natural gas and the gasification of coal. Compared with 1994, construction and industrial sand and gravel increased in value in 1995, while all other nonfuel mineral commodities (see table 1) showed a decrease.

According to the North Dakota Geological Survey (NDGS),[2] while nonfuel mineral production in the State had a relatively quiet year, oil production in the State stabilized for the first time since the mid-1980's; total production was expected to increase in 1995. The increase is largely attributed to an expanding Lodgepole Formation play (area being explored or leased) in Stark County and an active Red River Formation play in Bowman County.

Two companies, Georesources Inc. of Williston, Williams County, and NL Baroid Co. of Belle Fouch, SD, are producing leonardite, a soft, brown, earthy material mined as a source of organic chemicals and for nonfuel uses. The material, formed by natural weathering or oxidation of lignite, is associated with nearly all lignite outcrops in the State. The material was named in honor of the North Dakota State Geologist who served from 1908-32, because of his early work with the material. Because of its higher oxygen content and powdery structure, leonardite is not used as a fuel. Mines in Bowman and Williams Counties process leonardite for use as a dispersant and viscosity control in oil well drilling fluids, a water soluble wood stain, a stabilizer for ion exchange resins in water treatment, and as a soil conditioner.

A "Symposium on North Dakota Geology" was held April 20 in recognition of the NDGS Centennial observance in conjunction with the North Dakota Academy of Science annual meeting. Topics included

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN NORTH DAKOTA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	W	W	59	W	W	W
Lime	do.	W	$4,800	W	$6,590	W	W
Peat	metric tons	(3)	W	W	W	W	W
Sand and gravel (construction)	thousand metric tons	e7,700	e20,400	6,810	18,500	7,000	$20,000
Stone (crushed)	do.	W	W	—	—	—	—
Combine value of clays (common), gemstones, sand and gravel (industrial), stone [crushed volcanic cinder (1993)], and values indicated by symbol W		XX	131	XX	199	XX	4,530
Total		XX	25,300	XX	25,300	XX	24,500

eEstimated. pPreliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Less than 1/2 unit.

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discussions of the State's mineral resources, highlighted by information regarding the building stones used in the State Capitol. The North Dakota State Historical Society recently published a *Visitor's Guide to the North Dakota Capitol Grounds: Building, Monuments, and Stones.*

The NDGS and the Saskatchewan Department of Energy and Mines cosponsored the Third International Williston Basin Horizontal Well Workshop from April 3 to May 2 in Regina, Saskatchewan. About 450 people attended the workshop, which was intended to facilitate communication and cooperation among companies and individuals interested in horizontal drilling to assess the basin's mineral content and potential for mineral production. The NDGS reported that information and ideas gained from the workshop were being translated fairly quickly into drilling and development activity in North Dakota. A fourth such workshop was scheduled for spring 1996 in Bismarck, ND.

An introduction to North Dakota's rocks and minerals, including rules for collecting on various Federal, State, and privately owned lands, appeared in the *NDGS Newsletter* (V. 22, No. 2, pp. 6-12). The article, written for the rockhound, noted that a wide variety of lapidary and collectible materials can be found in the State, including petrified wood, agates, jasper, flint, and a wide variety of concretions and nodules.

During the 1995 session of the State Legislature, the NDGS lost funding for one full-time equivalent position, and underwent a subsequent reduction-in-force that called for the elimination of the position of Assistant State Geologist.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Estimates for some nonfuel minerals, especially construction sand and gravel, are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the NDGS.

TABLE 2

NORTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	259	$1,680	$6.47
Plaster and gunite sands	2	16	8.00
Asphaltic concrete aggregates and other bituminous mixtures	484	1,240	2.56
Road base and coverings	1,770	4,130	2.34
Fill	151	250	1.66
Snow and ice control	21	74	3.52
Railroad ballast	7	56	8.00
Roofing granules	3	25	8.33
Other	15	96	6.40
Unspecified:[2] Estimated	4,100	10,900	2.66
Total or average	6,810	18,500	2.71

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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OHIO



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Al	Aluminum plant	D-S	Dimension Sandstone	Lime	Lime plant
CC-Sh	Common Clay & Shale	FC	Fire Clay	Peat	Peat
Cem	Cement plant	Gyp	Gypsum	Salt	Salt
CS	Crushed Stone	IS	Industrial Sand	SG	Sand and Gravel
D-L	Dimension Limestone			Steel	Iron and Steel plant

Concentration of mineral operations

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF OHIO

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Ohio Department of Natural Resources, Division of Geological Survey, for collecting information all nonfuel minerals.

Ohio ranked 14th in the Nation in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). Ohio ranked 15th in 1994 (based on final 1994 data). The estimated value for 1995 was $871 million, a decrease of 1% compared with the $880 million of 1994. This followed increases of 15% from 1992 to 1993 and 3.5% from 1993 to 1994. The State accounted for more than 2% of the U.S. total nonfuel mineral production value. During 1995, substantially increased values of lime, construction sand and gravel, and clay minerals were offset mainly by 10% and 12% decreases, respectively, in crushed stone and portland cement values, accounting for the year's small net decrease in value. Compared with that of 1994, the 1995 values of the following commodities increased: construction sand and gravel, lime, industrial sand and gravel, salt, common clays, and gypsum. Decreases occurred in crushed stone, portland and masonry cements, fire clays, and peat.

Based on USGS estimates of the quantities of minerals produced in the United States during 1995, Ohio led the Nation in lime production for the second year in a row. The State remained second in the production of fire clays; fourth in construction sand and gravel, salt, and common clays; and eighth in industrial sand and gravel. The State climbed from 11th to 10th in the production of peat and marginally dropped from 7th to 8th in crushed stone, albeit in a virtual tie with 7th-ranked Virginia. Although not 1ranking among the top 10 States, Ohio operations produced significant quantities of dimension stone and portland and masonry cements. While Ohio was sixth of six States with reported production of ball clay in 1994, none was reported to the USGS in 1995. The State's mines exclusively produce industrial minerals

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN OHIO[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	92,500	$11,300	W	W	W	W
Portland	do.	1,490,000	90,300	1,050,000	$69,700	926,000	$61,200
Clays	thousand metric tons	[3]2,160	[3]12,000	[3]2,080	[3]12,500	2,430	15,200
Gemstones		NA	5	NA	43	NA	43
Lime	thousand metric tons	1,700	101,000	1,850	113,000	2,030	121,000
Sand and gravel:							
Construction	do.	[e]46,400	[e]203,000	47,700	205,000	49,500	220,000
Industrial	metric tons	1,360,000	27,500	1,260,000	27,700	1,270,000	28,000
Stone:							
Crushed	thousand metric tons	52,200	228,000	56,400	251,000	58,500	226,000
Dimension	metric tons	[4]25,700	[4]1,210	W	W	23,600	1,030
Combined value of clays (ball), gypsum (crude), peat, salt, silica stone[5] (1993), stone [dimension limestone (1993), dimension limestone and sandstone (1994)], and values indicated by symbol W		XX	176,000	XX	201,000	XX	208,000
Total		XX	851,000	XX	880,000	XX	880,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Excludes certain stones; kind and value included with "Combined value" data.

[5]Formerly identified as "Abrasives." Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

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and coal; any metals, especially steel and aluminum, produced in the State are processed from materials received from other domestic and foreign sources. Ohio continued to be the Nation's second leading raw steel-manufacturing State with an estimated output of almost 15 million metric tons[2] (16.4 million short tons) of raw steel, as reported by the American Iron and Steel Institute. The State remained the fourth leading producer of primary aluminum in the Nation in 1995. Ohio had previously ranked 5th in 1993.

The combined output of construction aggregates—crushed limestone, crushed sandstone, and sand and gravel—was expected to exceed 90 million tons (100 million short tons), in 1995, according to the Ohio Division of Geological Survey. It was not expected to reach more than the 106-million-ton-level (117 million short tons) achieved the previous year. This lower production, for the most part, was the result of two factors. Unusually ideal weather during 1994 from midsummer through December put many construction projects ahead of schedule, and the Ohio Department of Transportation decreased the amount of 1995 highway funds available for road construction.

While Ohio's industrial mineral operations continued to win national environmental and reclamation awards, public reactions to the opening of new aggregate mines, as well as the expansion of existing mines, often continued to be negative. Ohio's industrial mineral producers continued to counter this negativism with positive public relations, including site tours, open houses, and "Adopt-a-School" programs. The Ohio Aggregates Association, the trade association representing Ohio's aggregate industry, contributed financial support to the "Ohio Mineral Industries and the Environment" teacher workshops. The Ohio Geological Survey and the University of Akron annually cosponsor week-long workshops to educate teachers of the importance of rocks and minerals in the public's everyday lives and how mining is compatible with environmental protection. Beginning with 1995, the workshops were conducted at two separate locations to better accommodate those living in the northern and southern portions of the State.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodities.

All 1995 USGS data are estimated as of Dec. 1995. Some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

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TABLE 2

OHIO: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	472	$2,080	$4.41
Riprap and jetty stone	881	3,740	4.25
Filter stone	133	571	4.29
Other coarse aggregate	496	2,290	4.61
Coarse aggregate, graded:			
Concrete aggregate, coarse	3,870	16,000	4.13
Bituminous aggregate, coarse	2,740	11,000	4.02
Bituminous surface-treatment aggregate	339	2,460	7.24
Railroad ballast	1,750	6,540	3.75
Other graded coarse aggregate	339	1,630	4.81
Fine aggregate (-3/8 inch):			
Stone sand, concrete	5,660	21,500	3.80
Stone sand, bituminous mix or seal	611	2,370	3.87
Screening, undesignated	573	2,310	4.03
Coarse and fine aggregates:			
Graded road base or subbase	8,530	33,800	3.96
Unpaved road surfacing	4,760	20,900	4.39
Terrazzo and exposed aggregate	8	49	6.13
Crusher run or fill or waste	600	2,460	4.11
Other coarse and fine aggregates	82	314	3.83
Other construction materials	420	1,670	3.96
Agricultural: Agricultural limestone[3]	1,090	5,430	4.98
Chemical and metallurgical:			
Cement manufacture	1,700	7,020	4.14
Lime manufacture	W	W	2.99
Dead-burned dolomite manufacture	291	761	2.62
Flux stone	702	5,530	7.87
Glass manufacture	153	1,690	11.10
Sulfur oxide removal	W	W	11.40
Special:			
Asphalt fillers or extenders	W	W	9.74
Whiting or whiting substitute	W	W	23.50
Other fillers or extenders	W	W	8.41
Other specified uses not listed	1,180	6,730	5.70
Unspecified:[4]			
Actual	17,200	82,200	4.77
Estimated	1,740	9,570	5.49
Total or average	56,400	251,000	4.45

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."
[1]Includes dolomite, limestone, limestone-dolomite, and sandstone.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes other agricultural uses.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
OHIO: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993[r]				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	92	38,600	$170,000	$4.40	83	41,700	$190,000	$4.56
Dolomite	16	13,000	56,200	4.31	21	14,500	59,900	4.15
Sandstone	5	231	810	3.51	5	232	832	3.59
Total or average	XX	51,800	227,000	4.37	XX	56,400	251,000	4.45

[r]Revised. XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4
OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	9,450	$38,600	$4.09
Plaster and gunite sands	181	1,110	6.14
Concrete products (blocks, bricks, pipe, decorative, etc.)	1,360	6,130	4.50
Asphaltic concrete aggregates and other bituminous mixtures	5,210	21,600	4.15
Road base and coverings	3,150	15,200	4.81
Fill	4,350	16,700	3.85
Snow and ice control	220	909	4.13
Filtration	103	619	6.01
Other	308	1,200	3.88
Unspecified:[2]			
Actual	16,400	71,800	4.38
Estimated	6,960	31,000	4.45
Total or average	47,700	205,000	4.30

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

OHIO: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

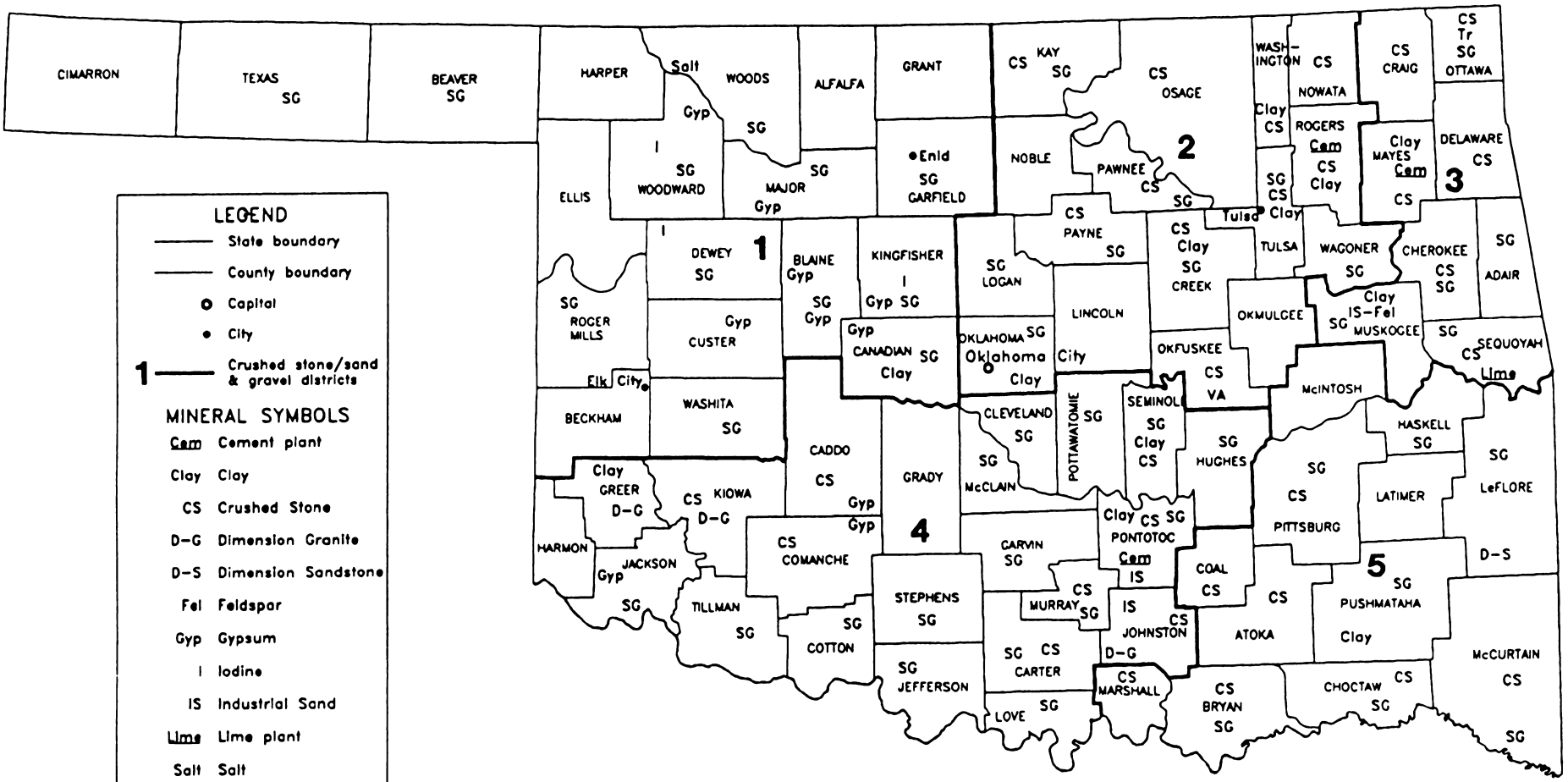
Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	505	1,760	3,870	16,800	2,760	11,500
Asphaltic concrete aggregates and road base materials[3]	236	939	4,220	18,700	3,140	11,400
Other miscellaneous uses[4]	6	73	252	1,120	94	367
Unspecified:[5]						
Actual	—	—	1,760	8,930	12,000	50,400
Estimated	2,500	11,200	1,120	5,860	2,220	9,390
Total	3,250	13,900	11,200	51,400	20,200	83,000

	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,340	5,450	1,660	6,570	858	3,840
Asphaltic concrete aggregates and road base materials[3]	1,730	8,220	2,010	8,210	1,390	6,110
Other miscellaneous uses[4]	43	168	189	757	48	239
Unspecified:[5]						
Actual	1,800	8,530	320	1,610	563	2,340
Estimated	549	2,270	471	1,900	103	406
Total	5,460	24,600	4,650	19,100	2,960	12,900

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill.
[4]Includes filtration, and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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OKLAHOMA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF OKLAHOMA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Oklahoma Geological Survey for collecting information on all nonfuel minerals.

Oklahoma ranked 34th in the Nation in total nonfuel mineral production value[1] in 1995, climbing from 35th in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $374 million, a 10% increase from that of 1994. This increase followed a 14% increase from 1993 to 1994 (based on final data). The State accounted for 1% of the U.S. total nonfuel mineral production value.

In 1995, crushed stone continued as Oklahoma's leading nonfuel mineral commodity, accounting forabout 39% of the State's total nonfuel mineral value. The combined values of construction materials—crushed stone, portland cement, construction sand and gravel, and gypsum—accounted for 79% of the same total value. The increase in mineral value in 1995 mostly resulted from the increase in crushed stone and a smaller yet substantial increase in iodine. In 1994, portland cement and crushed stone provided 85% of the year's total increase, while most other nonfuel mineral commodities also rose in value. Compared with 1994, all nonfuel minerals increased in value in 1995 except for those of masonry cement, tripoli, and feldspar, which had small decreases.

Oklahoma's mines exclusively produced industrial minerals; no metals were mined in the State. Based on USGS estimates of the quantities produced in the 50 States during 1995, Oklahoma remained first in iodine and crude gypsum; second of four States that produce tripoli; third in feldspar; and ninth in industrial sand and gravel. In addition, significant quantities of crushed stone, portland cement, construction sand and gravel, masonry cement, and common clays were produced in the State.

The Oklahoma Geological Survey[2] reported that industrial mineral activity in the State improved moderately during 1995. Production increased for most construction materials, especially crushed stone, construction sand and gravel, and portland cement. Construction activities that held steady or increased somewhat during 1995 were home building (mainly in metropolitan areas), highway construction, and

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN OKLAHOMA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	85,300	$6,720	91,000	$7,410	78,000	$6,370
Portland	do.	1,700,000	77,600	1,680,000	102,000	1,700,000	103,000
Clays	thousand metric tons	613	2,940	771	3,910	740	4,640
Gypsum (crude)	do.	2,650	15,400	2,890	17,000	2,750	17,500
Iodine (crude)	metric tons	1,940	15,400	1,630	12,800	1,830	19,600
Sand and gravel:							
Construction	thousand metric tons	[e]9,700	[e]27,300	8,480	27,200	8,600	29,200
Industrial	metric tons	1,210,000	23,200	1,230,000	24,000	1,230,000	24,000
Stone:							
Crushed	thousand metric tons	27,100	114,000	29,900	125,000	33,100	146,000
Dimension[3]	metric tons	2,350	838	3,980	1,250	16,300	2,100
Combined value of feldspar, gemstones, lime, salt, stone [dimension limestone and sandstone (1993), dimension sandstone (1994)], and tripoli		XX	14,900	XX	[r]19,400	XX	21,300
Total		XX	298,000	XX	[r]340,000	XX	374,000

[e]Estimated. [p]Preliminary. [r]Revised. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain stones; kind and value included with "Combined value" figure.

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commercial and apartment building. Fluctuations in building activity were, in part, a result of weather conditions; heavy rains and some flooding during April and May slowed work on a number of projects.

Oklahoma remained the sole domestic producer of iodine. Iodine prices rose slightly during the year, and production by the three operating companies increased. Deepwater Iodides, Inc., which in 1994 opened a plant in Woodward, Woodward County, to manufacture a broad line of inorganic and organic iodine compounds, declared Chapter 11 bankruptcy during 1995. However, later in the year, Tomen America, Inc., purchased Deepwater and continued operation under a new name, Deepwater Chemicals, Inc.

Other principal industries, including gypsum, silica sand, and portland cement, reported fairly stable markets during the year, but with no new operations, expansions, or notable technological gains. Dimension stone demand increased during the year in response to more housing construction in Oklahoma and surrounding States.

The number of mining permits in Oklahoma has also been relatively steady during the past several years. In 1995, the Oklahoma Department of Mines (ODM) issued 332 renewals and 97 new permits covering a total of 15,137 hectares (37,404 acres) of land. During 1994, there were 351 renewals and 94 new permits covering a total of 11,741 hectares (29,012 acres) of land. ODM reported that the State enacted a law in 1994 calling for Life-Expectancy Permits for mining activity. Previous rules had required that a company's mining permit be reviewed every 5 years. Under the new law, a company must submit a mining plan only once to cover the mine's life expectancy. ODM noted that Oklahoma is one of only a few States with such a permit system.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Oklahoma Geological Survey.

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TABLE 2

OKLAHOMA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	646	$4,090	$6.33
Filter stone	255	1,250	4.90
Other coarse aggregate	541	2,470	4.57
Coarse aggregate, graded:			
Concrete aggregate, coarse	8,010	37,700	4.71
Bituminous aggregate, coarse	1,390	7,380	5.30
Bituminous surface-treatment aggregate	664	3,960	5.97
Railroad ballast	1,020	5,240	5.14
Other graded coarse aggregate	W	W	5.43
Fine aggregate (-3/8 inch):			
Stone sand, concrete	487	1,690	3.47
Stone sand, bituminous mix or seal	252	883	3.50
Screening, undesignated	4,040	12,700	3.15
Other fine aggregate	W	W	5.10
Coarse and fine aggregates:			
Graded road base or subbase	2,220	8,300	3.74
Unpaved road surfacing	111	439	3.95
Terrazzo and exposed aggregate	W	W	3.46
Crusher run or fill or waste	3,020	10,500	3.48
Other coarse and fine aggregates	W	W	4.79
Other construction materials[3]	990	5,180	5.23
Agricultural: Agricultural limestone[4]	223	1,240	5.55
Chemical and metallurgical: Flux stone[5]	1,960	6,310	3.21
Unspecified:[6]			
Actual	3,070	11,500	3.74
Estimated	987	4,150	4.20
Total	29,900	125,000	4.18

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, granite, limestone, miscellaneous stone, sandstone, slate, and traprock.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes roofing granules.
[4]Includes poultry grit and mineral food and other agricultural uses.
[5]Includes cement manufacture and chemical stone for alkali works.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

OKLAHOMA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r44	r21,000	r$86,400	r$4.12	44	22,600	$91,200	$4.04
Dolomite	3	1,350	6,630	4.91	3	1,820	7,550	4.16
Granite	r3	W	W	r5.29	2	W	W	5.29
Traprock	1	W	W	3.97	1	W	W	4.18
Sandstone	r6	r1,640	r7,570	r4.62	5	2,170	10,400	4.81
Slate	1	30	128	4.27	1	W	W	1.08
Miscellaneous stone	—	—	—	—	1	23	99	4.30
Total	XX	27,100	114,000	4.21	XX	29,900	125,000	4.18

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

TABLE 4

OKLAHOMA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 3		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[3]	102	611	W	W	W	W	81	507
Coarse aggregate, graded[4]	1,540	8,460	993	4,200	6,830	32,300	2,410	13,000
Fine aggregate (-3/8 inch)[5]	386	1,070	W	W	W	W	380	1,110
Coarse and fine aggregate[6]	1,480	5,880	383	1,350	1,980	6,510	1,580	5,850
Other construction materials[7]	—	—	408	1,670	5,110	19,300	—	—
Agricultural[8]	(9)	(9)	(9)	(9)	—	—	(9)	(9)
Chemical and metallurgical[10]	(9)	(9)	(9)	(9)	800	3,280	(9)	(9)
Unspecified:[11]								
Actual	2,010	9,310	1,060	2,170	—	—	—	—
Estimated	319	1,060	119	501	54	192	495	2,400
Total	6,790	28,300	3,070	10,800	14,800	61,600	5,280	24,300

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]No crushed stone was produced in District 1.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Includes roofing granules.
[8]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[9]Withheld to avoid disclosing company proprietary data; included in "Total."
[10]Includes cement manufacture, chemical stone for alkali works, and flux stone.
[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

OKLAHOMA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	3,820	$12,600	$3.30
Plaster and gunite sands	73	213	2.92
Concrete products (blocks, brick, pipe, decorative, etc.)	65	180	2.77
Asphaltic concrete aggregates and other bituminous mixtures	524	1,280	2.44
Road base and coverings[2]	235	541	2.30
Fill	1,040	2,000	1.92
Other[3]	76	359	4.72
Unspecified:[4]			
Actual	1,120	4,640	4.14
Estimated	1,530	5,400	3.53
Total or average	8,480	27,200	2.91

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes snow and ice control.
[3]Includes filtration, railroad ballast, and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

OKLAHOMA: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

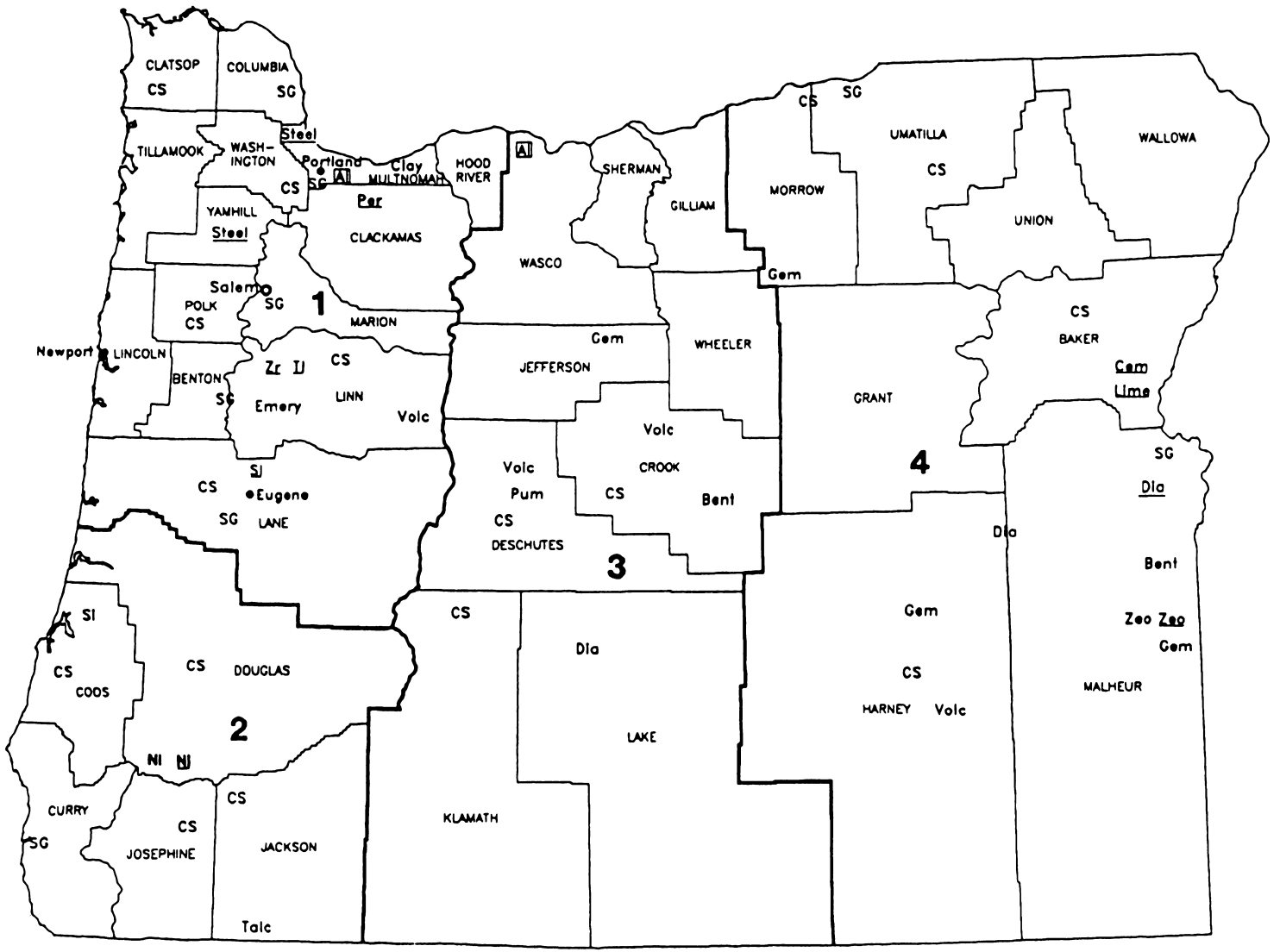
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	924	3,480	1,370	3,840	465	1,130	1,200	4,540
Asphaltic concrete aggregates and road base materials[4]	408	900	895	1,930	127	346	368	645
Other miscellaneous uses[5]	—	—	13	119	15	51	48	189
Unspecified:[6]								
Actual	—	—	—	—	—	—	1,120	4,640
Estimated	125	697	472	1,330	46	188	886	3,180
Total	1,460	5,080	2,750	7,210	652	1,710	3,620	13,200

[1]Production reported in District 5 was included with "District 4" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill and snow and ice control.
[5]Includes filtration, railroad ballast, and roofing granules.
[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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OREGON



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

- Al Aluminum plant
- Bent Bentonite
- Cem Cement plant
- Clay Clay
- CS Crushed Stone
- Dia Diatomite plant
- Emery Emery
- Gem Gemstone
- Lime Lime plant
- NI Nickel **NI Nickel plant**
- Per Perlite
- Per Perlite plant
- Pum Pumice
- SG Sand and Gravel
- Sl Silica
- Sl Silicon plant
- Steel Steel plant
- Talc Talc minerals
- Ti Titanium plant
- Volc Volcanic cinders
- Zeo Zeolites
- Zeo Zeolite plant
- Zr Zirconium plant

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF OREGON

In 1995, for the fifth year in a row and the seventh in the last 9 years, Oregon was 38th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was more than $261 million, almost an 8% increase compared with that of 1994. This followed a 7.4% increase from 1993 to 1994 (based on final data). The State accounted for a little less than 1% of the U.S. total nonfuel mineral production production value.

Industrial minerals accounted for nearly all of Oregon's nonfuel mineral production value, less than 1% resulting from the State's metal mine production. Crushed stone, by value, was Oregon's leading nonfuel mineral commodity, accounting for more than 40% of the State's total nonfuel mineral production value. Oregon's construction materials—crushed stone, construction sand and gravel, and portland cement, in descending order of value—represented more than 85% of the total value. Minimal quantities of copper and zinc and byproduct gold and silver were produced as a result of the continuing cleanup at Formosa Resources Corp.'s Silver Butte Mine, which ceased operation in 1993. Compared with 1994, the following nonfuel mineral values increased in 1995: crushed stone, portland cement, gemstones, pumice and pumicite pumicite, nickel ore, copper, zinc, and emery. Decreases occurred in construction sand and gravel, lime, diatomite, and gold.

Based on USGS estimates of the quantities produced in the 50 States during 1995, Oregon was the only State with mine production of nickel ore and emery. It remained the Nation's leading pumice-producing State and third of three diatomite-producing States; Oregon was third of five States that produced zeolites. Cominco American Inc's. Nickel Mountain Mine, recently the sole domestic producer of primary nickel, resumed production in 1995, owing to an increase in nickel prices. According to the company, the mine was shut down in the latter half of 1993 because of market disruptions and low nickel prices caused, in part, by a surge in nickel exports from Russia. Production of other metals, especially primary aluminum and raw steel, resulted from the processing of materials acquired from other domestic and foreign sources. Oregon remained 13th in the Nation in the

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN OREGON[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays	thousand metric tons	221	$1,410	240	$1,560	240	$1,560
Copper[3]	metric tons	703	1,420	106	260	100	300
Gemstones		NA	2,140	NA	2,160	NA	4,270
Nickel ore[4]	metric tons	2,460	W	—	—	1,650	W
Pumice and pumicite	do.	W	W	220,000	2,760	W	W
Sand and gravel (construction)	thousand metric tons	[e]15,800	[e]74,800	18,400	83,600	17,500	81,400
Silver[3]	metric tons	—	—	(5)	10	(5)	10
Stone (crushed)	thousand metric tons	18,900	84,700	18,900	90,100	21,500	105,000
Talc and pyrophyllite	metric tons	64	67	W	W	W	W
Zinc[3]	do.	—	—	118	128	118	138
Combine value of cement (portland), diatomite, emery, gold (1994-95), lime, and values indicated by symbol W		XX	61,600	XX	62,100	XX	68,200
Total		XX	226,000	XX	243,000	XX	261,000

[e]Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Production of ferronickel on a contained Ni basis has been as follows: 1993—4,878 metric tons valued at $28.0 million; 1994 the Nickel Mountain Mine was idle; and in 1995—an estimated 8,200 metric tons valued at $68.0 million.

[5]Less than 1/2 unit.

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production of primary aluminum.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, especially construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 2

OREGON: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	15	$84	$5.60
Riprap and jetty stone	200	647	3.24
Filter stone	128	694	5.42
Other coarse aggregate	315	1,160	3.68
Coarse aggregate, graded:			
Concrete aggregate, coarse	132	626	4.74
Bituminous aggregate, coarse	475	2,380	5.01
Bituminous surface-treatment aggregate	229	1,550	6.75
Railroad ballast	88	452	5.14
Other graded coarse aggregate	185	1,030	5.55
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	7.16
Stone sand, bituminous mix or seal	208	1,590	7.63
Screening, undesignated	63	184	2.92
Coarse and fine aggregates:			
Graded road base or subbase	7,180	34,600	4.82
Unpaved road surfacing	1,130	5,100	4.53
Terrazzo and exposed aggregate	2	53	26.50
Crusher run or fill or waste	465	2,170	4.66
Other coarse and fine aggregates	W	W	2.63
Other construction materials	363	1,300	3.59
Agricultural: Other agricultural uses	1	6	6.00
Chemical and metallurgical: Cement manufacture	[3]	[3]	2.20
Other miscellaneous uses: Sugar refining	[3]	[3]	10.30
Unspecified:[4]			
Actual	[3]	[3]	5.02
Estimated	3,030	13,700	4.52
Total	18,900	90,100	4.76

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes granite, limestone, miscellaneous stone, sandstone and quartzite, shell, slate, traprock and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

OREGON: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r1	W	W	r$2.20	1	W	W	$4.02
Granite	28	91	$482	5.30	27	54	$235	4.35
Traprock	r290	r16,600	r75,400	r4.54	295	15,200	71,500	4.72
Sandstone and quartzite	51	96	548	5.71	51	66	462	7.00
Slate	1	W	W	5.73	1	W	W	6.00
Volcanic cinder and scoria	51	116	682	5.88	51	104	W	W
Shell	1	39	138	3.54	1	32	103	3.22
Miscellaneous stone	r11	r1,220	r5,550	r4.53	37	2,570	13,300	5.19
Total	XX	18,900	84,700	4.48	XX	18,900	90,100	4.76

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not not add to totals shown.

TABLE 4

OREGON: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	514	1,950	123	547	21	91
Coarse aggregate, graded[4]	W	W	W	W	544	3,280
Fine aggregate (-3/8 inch)[5]	W	W	W	W	33	229
Coarse and fine aggregate[6]	7,100	34,700	1,200	4,980	730	2,970
Other construction materials	729	4,380	110	539	—	—
Agricultural[7]	—	—	1	6	—	—
Chemical and metallurgical[8]	—	—	—	—	(9)	(9)
Other miscellaneous uses[10]	—	—	—	—	(9)	(9)
Unspecified:[11]						
Actual	(9)	(9)	(9)	(9)	[12](9)	[12](9)
Estimated	(9)	(9)	(9)	(9)	599	2,640
Total	12,900	62,900	2,110	8,700	[12]3,890	[12]18,600

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Production reported in District 3 was included with "District 4" to avoid disclosing company proprietary data.
[2]Data are round to three significant digits; may not add to totals shown.
[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated).
[6]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Includes other agricultural uses.
[8]Includes cement manufacture.
[9]Withheld to avoid disclosing company proprietary data; included in "Total."
[10]Includes sugar refining.
[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[12]Includes unspecified within all districts.

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TABLE 5

OREGON: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	5,030	$20,300	$4.03
Plaster and gunite sands	30	112	3.73
Asphaltic concrete aggregates and other bituminous mixtures	1,850	9,420	5.10
Road base and coverings	6,830	33,000	4.83
Fill	855	2,600	3.04
Snow and ice control	72	411	5.71
Other[2]	678	3,080	4.55
Unspecified:[3]			
Actual	236	1,070	4.53
Estimated	2,820	13,700	4.84
Total or average	18,400	83,600	4.54

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filtration and railroad ballast.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

OREGON: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

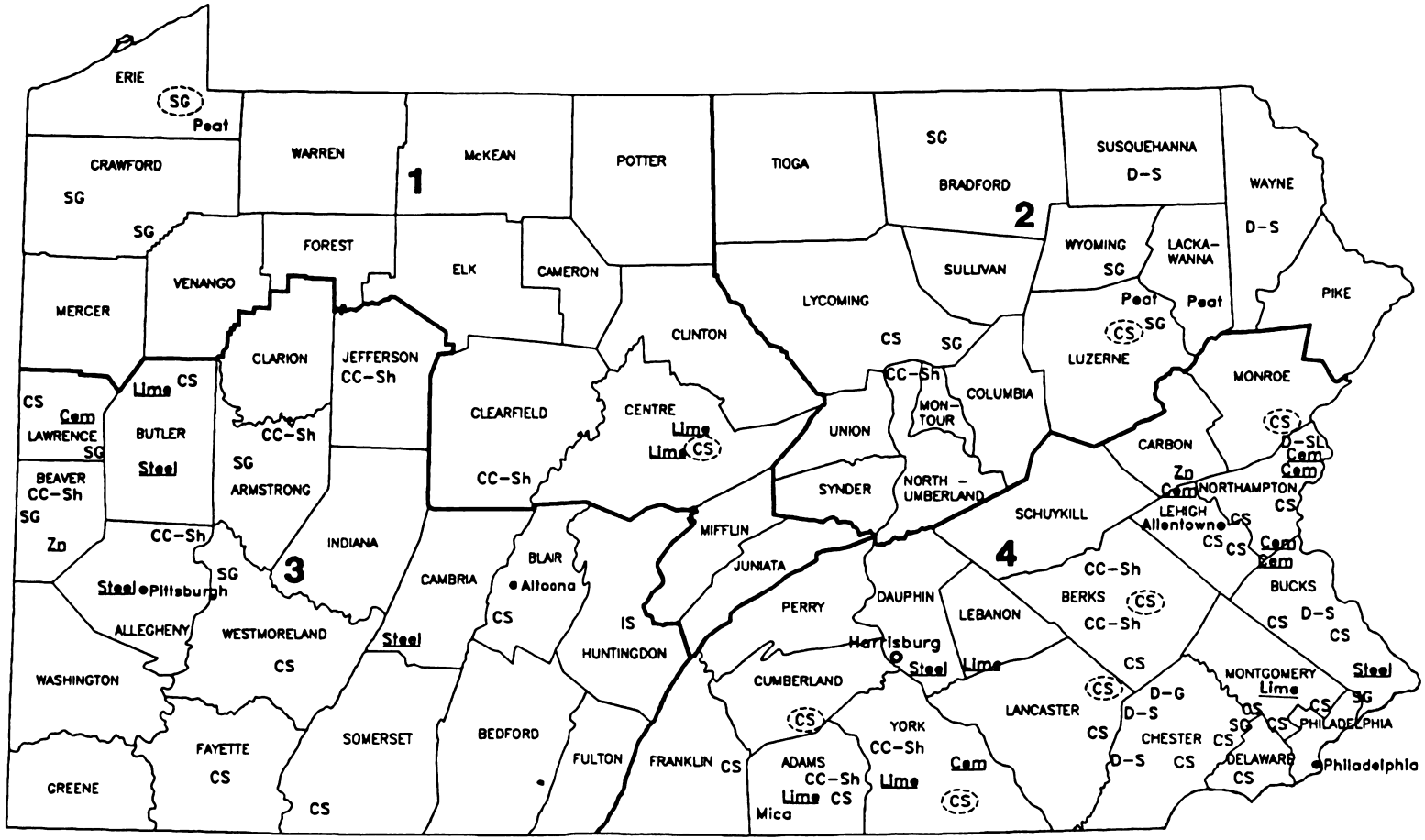
Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregates[2]	3,770	14,800	1,020	3,840	(3)	(3)	(3)	(3)
Asphaltic-bituminous mixtures	1,140	5,930	639	2,720	(3)	(3)	(3)	(3)
Road base and coverings	5,630	27,900	753	3,190	29	168	425	1,710
Fill	458	1,190	290	1,080	82	263	24	63
Snow and ice control	72	411	—	—	—	—	—	—
Other miscellaneous uses[4]	624	2,920	37	61	17	100	—	—
Unspecified:[5]								
Actual	—	—	—	—	—	—	[6]236	[6]1,070
Estimated	2,560	11,800	—	—	—	—	258	1,810
Total	14,300	65,000	2,730	10,900	191	822	[6]1,230	[6]6,920

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.
[6]Includes unspecified within all districts.

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PENNSYLVANIA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

CC-Sh	Common Clay & Shale
Cem	Cement plant
CS	Crushed Stone
D-G	Dimension Granite
D-S	Dimension Sandstone
D-SL	Dimension Slate
IS	Industrial Sand
Lime	Lime plant
Mica	Mica
Peat	Peat
SG	Sand and Gravel
Steel	Iron and Steel plant
Zn	Zinc plant

Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF PENNSYLVANIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Pennsylvania Bureau of Topographic and Geologic Survey, Department of Environmental Resources, for collecting information on all nonfuel minerals.

Pennsylvania ranked 12th among the 50 States in total nonfuel mineral production value[1] in 1995, down from 11th in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $1.05 billion, a 6% increase from that of 1994. This followed an 8.7% increase from 1993 to 1994 (based on final data). The State accounted for almost 3% of the U.S. total nonfuel mineral production value.

Pennsylvania continued to be among the Nation's leading producers of crushed stone, portland cement, lime, and masonry cement (in descending order of value); these four commodities accounted for 90% of the State's total nonfuel mineral production value. Most of the increase in value in 1995 resulted from the $56 million, or 12%, rise in crushed stone value. In 1994, the increased values of crushed stone and portland cement accounted for about 90% of that year's increase. Compared with 1994, other nonfuel minerals that increased in value in 1995 were lime, dimension stone, and common clays. Decreases were reported for construction sand and gravel, portland cement, masonry cement, and tripoli.

Based on USGS estimates of the quantities produced in the 50 States in 1995, Pennsylvania dropped from first to second in crushed stone. The State remained third in portland cement, fourth in lime, nd fourth of the four States that produce tripoli. While Pennsylvania climbed from eighth to sixth in dimension stone, it was seventh in peat production, and one of the top eight masonry cement-producing States. Significant quantities of construction and industrial sand and gravel and common clays were produced in the State. Pennsylvania is exclusively an industrial mineral- and coal-producing State; metals that were produced in the State, especially steel, were processed from materials received from other domestic or foreign sources. Pennsylvania continued to be the Nation's third leading raw steel-manufacturing State with an estimated output of almost 8.3 million metric tons[2] (9.2 million short tons) of raw steel, as reported by the American Iron and Steel Institute.

The Pennsylvania Geological Survey[3] reported that the aggregate industry was poised to respond to major infrastructure repairs as a result of the harsh winter and flooding associated with record snowfalls during the winter of 1995-96. Unfortunately, the Department

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN PENNSYLVANIA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	248,000	$18,700	245,000	$19,300	236,000	$18,600
Portland	do.	5,370,000	283,000	5,630,000	315,000	5,610,000	314,000
Clays	thousand metric tons	765	3,780	811	4,040	919	4,300
Gemstones		NA	1	NA	1	NA	1
Lime	thousand metric tons	1,540	95,400	1,590	95,500	1,620	101,000
Peat	metric tons	9,000	249	10,000	296	[3]15,200	[3]291
Sand and gravel (construction)	thousand metric tons	[e]16,100	[e]83,900	15,900	89,700	15,100	86,800
Stone:							
Crushed	do.	[r4]70,100	[r4]409,000	76,700	462,000	83,500	518,000
Dimension	metric tons	35,700	9,890	[4]43,700	[4]7,280	69,900	12,700
Total[5]		XX	[r]903,000	XX	[r]992,000	XX	1,050,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Data series changed to production beginning in 1995, prior years shipment data may not be comparable.

[4]Excludes certain stones that must be concealed to avoid disclosing company proprietary data.

[5]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

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of Transportation's funds for this period of time were depleted. Nonetheless, the expansion of existing operations and the initiation of a grassroots exploration in the State were indicated by about 30 aggregate operations based on 1995 applications made to the State for such activities. Sand and gravel operators led the way. Twelve sand and gravel producers applied for more than 350 hectares (860 acres) of new mining reserves, 75% of which lay behind the glacial border in the extreme northwestern portion of the State. Ten crushed stone operators applied for more than 400 hectares (1,000 acres) of new reserves. Six of the 1995 crushed stone applications were for western Pennsylvania and fell into two categories. These included the continuing development of underground operations, particularly in relatively flat-lying Carboniferous Age limestones, and the plans of coal companies to produce aggregates as a coproduct during their coal strip mining process. An eastern Pennsylvania operator applied for a permit to remine an abandoned magnetite mine mostly for traprock.

Bellefonte Lime Co. purchased the assets, real property, and mineral rights for the production of lime and limestone of its nearby competitor Centre Lime and Stone Co. Acquisition of Centre doubled Bellefonte's lime production capacity and strengthened its position in the markets of the Mid-Atlantic and Northeastern States.

Exploration for high-purity carbonates continued, particularly in central Pennsylvania where folded beds of Ordovician carbonate rock are quite pure in minable thicknesses. Global Stone purchased Delta Carbonate, which produces carbonate whiting, a pure fine white form of calcium carbonate, located in the more geologically complex York Valley in the south-central portion of the State.

Development of another industrial mineral resource, "slabby-bedded," 75% calcium carbonate stone deposits that contain clay, is undergoing some growth and holds some potential promise. This material would not be considered as a source of aggregate but it performs exceptionally well as a scrubbing agent for sulfur capture in cogeneration, fluidized-bed combustion powerplants. Many of the 20 or so plants in the eastern portion of the State have begun using this material. A potentially larger scrubbing market is the coal-fired powerplants. Recent individual powerplant requests for proposals (RFP's) have included a call for bids to supply up to 272,000 tons (300,000 short tons) of sorbent per year.

According to the Department of Environmental Protection's (DEP) Bureau of Mining and Reclamation, the building stone industry continued to expand in terms of the number of operators seeking permits and the tonnage and value of product produced annually. With the permit application of another 22 bluestone quarries, there are well over 100 active 0.4 to 2 hectare (1 to 5 acre) quarries in extreme northeastern Pennsylvania, most of which are in Susquehanna County. In addition to the famous slate and "black granite" of eastern Pennsylvania, sandstone is also a major source of building and dimension stone in the State.

Preliminary figures from DEP's Bureau of Deep Mine Safety indicated that bituminous coal production for 1995 was slightly more than the previous year, totaling approximately 55 million metric tons, with strip-mine tonnage continuing to decline and deep-mine production continuing to increase. Deepmining accounted for about 74% of all bituminous production, with a majority of this coming from Greene County longwall mines developed in the Pittsburgh seam. Further information about coal, a fuel mineral, may be obtained by contacting the Pennsylvania Geological Survey.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

[3]This report includes information provided by the Pennsylvania Geological Survey.

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TABLE 2

PENNSYLVANIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	935	$6,180	$6.61
Filter stone	527	3,110	5.90
Other coarse aggregate[3]	493	2,960	6.01
Coarse aggregate, graded:			
Concrete aggregate, coarse	7,130	41,600	5.84
Bituminous aggregate, coarse	6,750	39,000	5.77
Bituminous surface-treatment aggregate	2,530	17,000	6.72
Railroad ballast	794	4,520	5.69
Other graded coarse aggregate	3,570	22,900	6.42
Fine aggregate (-3/8 inch):			
Stone sand, concrete	855	5,020	5.87
Stone sand, bituminous mix or seal	3,390	19,700	5.82
Screening, undesignated	1,360	7,800	5.75
Other fine aggregate	268	1,850	6.90
Coarse and fine aggregates:			
Graded road base or subbase	13,100	67,100	5.12
Unpaved road surfacing	2,040	10,800	5.26
Terrazzo and exposed aggregate	64	1,330	20.80
Crusher run or fill or waste	1,350	4,910	3.63
Other coarse and fine aggregates	4,430	26,600	6.00
Other construction materials[4]	1,750	17,300	9.88
Agricultural: Agricultural limestone[5]	819	9,350	11.40
Chemical and metallurgical:			
Cement manufacture	4,940	26,900	5.45
Lime manufacture	583	4,140	7.11
Flux stone	W	W	11.90
Sulfur oxide removal	361	3,980	11.00
Special:			
Mine dusting or acid water treatment	35	522	14.90
Asphalt fillers or extenders	481	5,390	11.20
Whiting or whiting substitute	W	W	37.80
Other fillers or extenders	9	129	14.30
Other specified uses not listed	378	3,160	8.36
Unspecified:[6]			
Actual	11,200	67,600	6.05
Estimated	6,550	40,900	6.23
Total	76,700	462,000	6.02

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[1]Includes dolomite, granite, limestone, limestone-dolomite, marble, miscellaneous stone, sandstone and quartzite, and traprock.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes macadam.

[4]Includes drain fields and roofing granules.

[5]Includes other agricultural uses and poultry grit and mineral food.

[6]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

PENNSYLVANIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r111	r40,300	r$233,000	r$5.77	110	44,000	$256,000	$5.83
Dolomite	r20	r12,900	r76,900	r5.96	18	14,700	90,000	6.13
Sandstone and quartzite	r35	r6,060	r38,300	r6.32	37	7,030	45,500	6.46
Traprock	r10	r2,340	r13,400	r5.73	11	2,650	21,700	8.21
Granite	r7	r2,590	r17,000	r6.56	7	2,570	15,800	6.13
Marble	—	—	—	—	1	476	3,210	6.73
Miscellaneous stone	16	5,850	30,300	5.18	15	5,310	29,300	5.52
Total	XX	r70,100	r409,000	r5.83	XX	76,700	462,000	6.02

rRevised. XX Not applicable.

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes "limestone-dolomite" reported with no distinction between the two.

TABLE 4

PENNSYLVANIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	W	W	W	W	549	3,660	1,060	6,660
Coarse aggregate, graded[3]	W	5,680	W	7,860	4,820	32,100	13,400	79,400
Fine aggregate (-3/8 inch)[4]	377	W	W	W	1,110	6,750	3,840	23,100
Coarse and fine aggregate[5]	782	W	2,440	W	4,800	28,500	13,400	77,800
Other construction materials[6]	1,220	4,610	2,290	16,300	8	51	1,230	7,270
Agricultural[7]	14	208	49	448	50	596	707	8,100
Chemical and metallurgical[8]	571	4,040	(*)	(*)	(*)	(*)	(*)	(*)
Special[10]	—	—	(*)	(*)	(*)	(*)	(*)	(*)
Other miscellaneous uses[11]	63	70	243	2,720	1,220	8,200	4,690	29,200
Unspecified:[12]								
Actual	—	—	719	4,710	4,220	25,900	6,230	36,900
Estimated	817	5,830	522	3,200	476	3,360	4,740	28,500
Total	3,840	20,400	6,260	35,300	17,200	109,000	49,300	297,000

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.

[6]Includes drain fields.

[7]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

[8]Includes cement manufacture, flux stone, lime manufacture, and sulfur oxide removal.

[9]Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

[10]Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whiting or whiting substitute.

[11]Includes other specified uses not listed.

[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

PENNSYLVANIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	5,210	$33,300	$6.40
Plaster and gunite sands	121	916	7.57
Concrete products (blocks, brick, pipe, decorative, etc.)	489	3,540	7.23
Asphaltic concrete aggregates and other bituminous mixtures	2,590	15,700	6.05
Road base and coverings[2]	2,230	11,200	5.00
Fill	424	1,920	4.53
Snow and ice control	327	2,000	6.11
Roofing granules	12	143	11.90
Filtration	126	958	7.60
Other[3]	464	2,320	5.00
Unspecified:[4]			
Actual	2,330	9,140	3.93
Estimated	1,590	8,590	5.42
Total or average	15,900	89,700	5.64

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement).
[3]Includes railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

PENNSYLVANIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

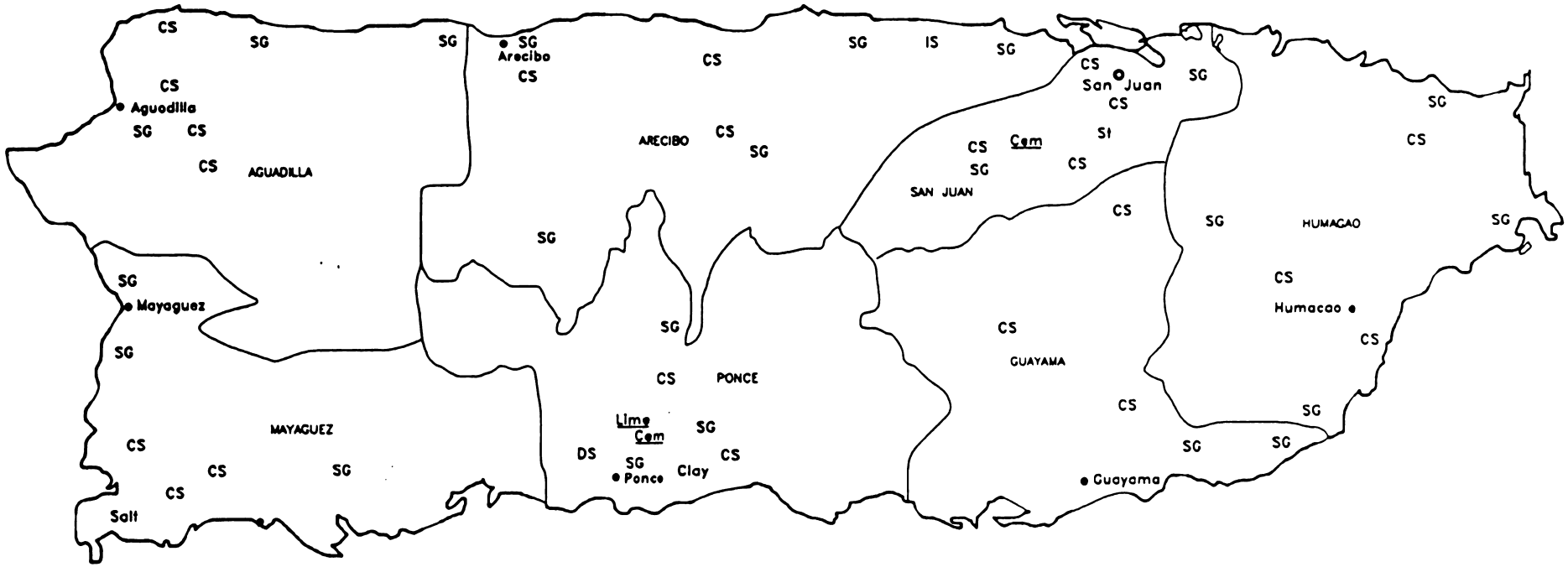
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	823	4,130	1,400	9,060	2,070	13,900	1,520	10,600
Asphaltic/bituminous mixtures	372	2,250	573	3,650	1,510	8,810	134	950
Road base and coverings[3]	1,360	6,370	330	1,620	503	2,920	39	240
Fill	180	459	44	171	61	259	139	1,030
Snow and ice control	132	796	100	665	65	323	29	215
Other miscellaneous uses[4]	183	941	111	754	169	695	138	1,030
Unspecified:[5]								
Actual	239	1,590	58	408	892	2,100	1,140	5,040
Estimated	869	3,770	348	1,950	102	501	267	2,370
Total	4,160	20,300	2,960	18,300	5,370	29,600	3,410	21,500

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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PUERTO RICO



LEGEND	
State boundary	
District boundary	
Capital	
City	

MINERAL SYMBOLS			
Cem	Cement plant	Salt	Salt
Clay	Clay	SG	Sand & Gravel
CS	Crushed Stone	St	Stone
DS	Dimension Stone	IS	Industrial Sand
Lime	Lime plant		

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF PUERTO RICO AND THE ADMINISTERED ISLANDS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Department of Natural Resources, Commonwealth of Puerto Rico, for collecting information on all nonfuel minerals.

In 1995, the estimated value[1] of nonfuel mineral commodities produced in Puerto Rico was $85 million, according to the U.S. Geological Survey (USGS). Data have been withheld for portland cement and industrial sand and gravel to protect company proprietary data. Consequently, a comparison of the State's total nonfuel mineral values from year to year (see table 1) would not be truly representative of changes occurring in the Commonwealth's nonfuel mineral economy. Portland cement and crushed stone by value were the island's leading nonfuel mineral commodities, accounting for the large majority of the reported total for Puerto Rico. If ranked in comparison with the 50 United States, Puerto Rico would rank 43d based on table 1 or close to 39th if portland cement and industrial sand and gravel were included in the State's total nonfuel mineral value. Compared with 1994, the mineral commodity values for crushed stone, lime, industrial sand and gravel, and common clays increased for Puerto Rico. The value of portland cement decreased slightly. Crushed stone values for American Samoa, Guam, and the Virgin Islands (data withheld) increased.

Based on USGS estimates of the quantities of nonfuel mineral commodities produced on all of the aforementioned islands, production increased for all except portland cement and industrial sand and gravel in Puerto Rico.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates as of Dec. 1995. Crushed stone and portland cement estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

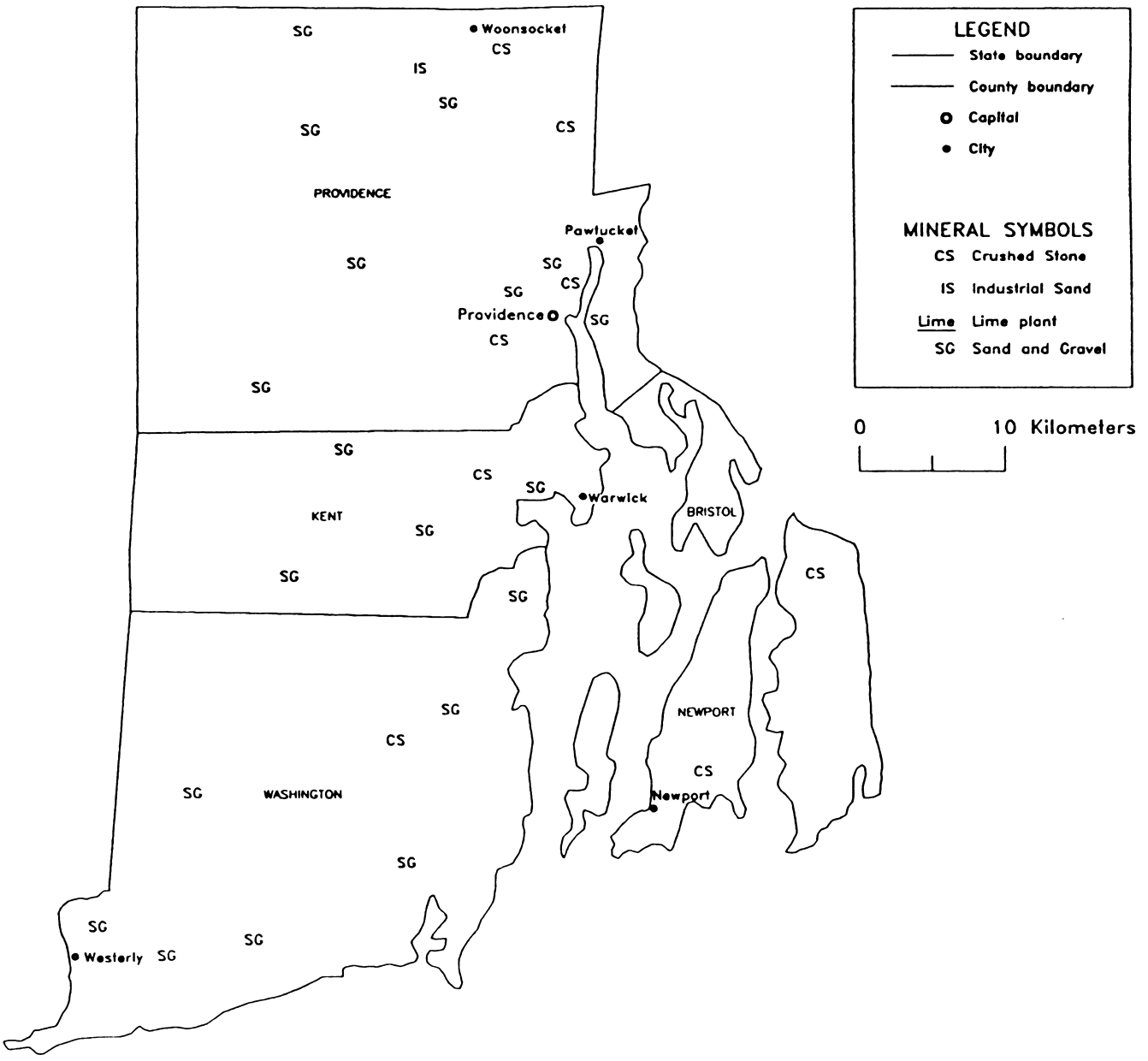
TABLE 1
NONFUEL RAW MINERAL PRODUCTION[1] [2] IN THE COMMONWEALTH OF PUERTO RICO AND ISLANDS ADMINISTERED BY THE UNITED STATES

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
PUERTO RICO							
Cement (portland)	metric tons	1,310,000	$72,600	W	W	W	W
Clays	thousand metric tons	155	508	119	$338	140	$370
Lime	do.	—	—	23	2,970	27	3,650
Sand and gravel (industrial)	metric tons	[e]58,000	[e]1,400	W	W	W	W
Stone (crushed)	thousand metric tons	7,850	51,100	10,500	78,400	10,900	80,800
Total		XX	126,000	XX	[3]81,700	XX	[3]84,800
ADMINISTERED ISLANDS							
American Samoa:							
Stone (crushed)	thousand metric tons	83	W	84	W	90	W
Guam: Stone (crushed)	do.	1,370	15,100	2,150	12,700	2,200	13,100
Total[3]		XX	15,100	XX	12,700	XX	13,100

[e]Estimated. [p]Preliminary. W Withheld to avoid disclosing company proprietary data; not included in "Total." XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Total does not include values of items withheld.

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RHODE ISLAND



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF RHODE ISLAND

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Rhode Island Department of Environmental Management for collecting information on all nonfuel minerals.

In 1995, Rhode Island ranked 48th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $30 million, a 12% increase from that of 1994. This followed a 14% increase from 1993 to 1994 (based on final data). The State accounted for about one-tenth of 1% of the total U.S. nonfuel mineral production value. The increase in value of construction sand and gravel, the State's leading mineral commodity, accounted for all of Rhode Island's gain in nonfuel mineral value in 1995. Crushed stone was responsible for most of the increase in 1994. Production of industrial sand and gravel was reported, but data have been withheld from table 1 to protect company proprietary data.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for construction sand and gravel and crushed stone are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN RHODE ISLAND[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$1	NA	$1	NA	$1
Sand and gravel (construction)	thousand metric tons	e2,500	e13,900	2,310	14,200	2,900	18,100
Stone (crushed)	do.	1,290	9,250	1,610	12,200	1,500	11,400
Total[3]		XX	23,200	XX	26,300	XX	29,500

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Partial total, excludes values which must be concealed to avoid disclosing company proprietary data.

TABLE 2
RHODE ISLAND: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse and fine aggregates: Crusher run or fill or waste[3]	4	$50	$12.50
Agricultural: Agricultural limestone	9	101	11.20
Other specified uses not listed	3	30	10.00
Unspecified:[4]			
Actual	730	6,130	8.40
Estimated	862	5,870	6.81
Total	1,610	12,200	7.58

[1]Includes granite, limestone, and traprock.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone and graded road base or subbase.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
RHODE ISLAND: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r2	W	W	r$8.06	2	W	W	$8.46
Granite	r3	572	$3,460	r6.05	3	568	$3,450	6.07
Traprock	2	W	W	8.04	2	W	W	8.27
Total	XX	1,290	9,250	7.17	XX	1,610	12,200	7.58

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Data are rounded to three significant digits.

TABLE 4
RHODE ISLAND: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

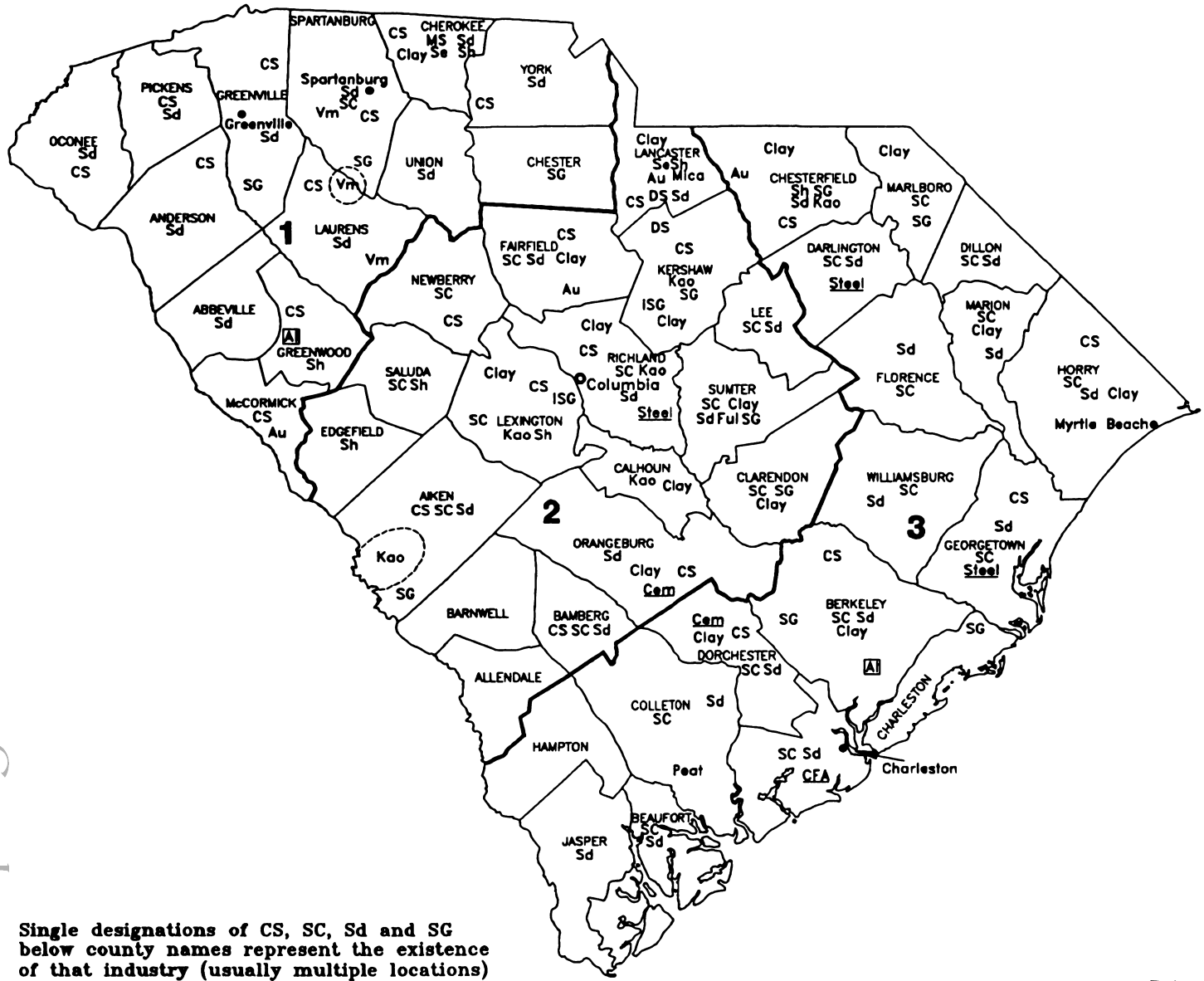
Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	613	$4,210	$6.87
Plaster and gunite sands	12	90	7.50
Asphaltic concrete aggregates and other bituminous mixtures	386	3,000	7.78
Road base and coverings	29	189	6.52
Fill	70	198	2.83
Snow and ice control	9	97	10.80
Railroad ballast	(2)	(2)	16.00
Unspecified:[3]			
Actual	(2)	(2)	3.05
Estimated	950	5,630	5.93
Total or average	2,310	14,200	6.14

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Withheld to avoid disclosing company proprietary data; included in "Total."
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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SOUTH CAROLINA



Single designations of CS, SC, Sd and SG below county names represent the existence of that industry (usually multiple locations) in that county and not necessarily specific locations.

LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

A	Aluminum plant
Au	Gold
Cem	Cement plant
CFA	Chrome Ferroalloy plant
Clay	Clay
CS	Crushed Stone
DS	Dimension Stone
Ful	Fuller's earth
ISG	Industrial Sand and Gravel
Kao	Kaolin
Mica	Mica
MS	Manganese Schist
Peat	Peat
SC	Sand and Clay
Sd	Sand
Se	Sericite
SG	Sand and Gravel
Sh	Shale
Steel	Iron and Steel plant
Vm	Vermiculite

Concentration of mineral operations

0 40 Kilometers

Principal Mineral-Producing Localities

THE MINERAL INDUSTRY OF SOUTH CAROLINA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the South Carolina Geological Survey for collecting information on all nonfuel minerals.

South Carolina ranked 30th in the Nation in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State ranked 27th in 1994 (based on final data). The estimated value for 1995 was $426 million, about a 2% decrease from that of 1994. This followed a 10.8% increase from 1993 to 1994. The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

In 1995, decreases in portland cement, kaolin clay, and gold values were not completely offset by increases in crushed stone and construction and industrial sand and gravel. Other nonfuel mineral values that increased in 1995 included: masonry cement, crushed marble, dimension stone, silver, and gemstones. Decreases occurred in vermiculite and common clays. Nearly all commodities increased in value in 1994, led by portland cement which rose almost 31%, or $34 million; gold had a moderate decrease in value.

Based on USGS estimates of the quantities produced in the 50 States in 1995, South Carolina remained the first of 2 States that produced vermiculite, ninth in gold, and one of the top 9 masonry cement-producing States. The State rose from fifth to fourth in crude mica and from eighth to seventh in common clays, but it dropped from second to third in kaolin. Manganiferous ore was produced in South Carolina alone; the ore, a manganiferous schist, was used as a brick colorant and not in the production of manganese metal. Additionally, the State's mines and manufacturing plants produced significant quantities of crushed stone, portland cement, construction and industrial sand and gravel, and dimension stone. Primary aluminum and raw steel were produced in the State from raw materials that were acquired from other domestic and foreign sources. South Carolina ranked 11th of 14 States in the production of primary aluminum in 1995.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN SOUTH CAROLINA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	2,130,000	$109,000	2,210,000	$143,000	1,960,000	$127,000
Clays	thousand metric tons	1,540	31,300	[3]1,520	[3]30,400	1,530	23,100
Sand and gravel:							
Construction	do.	[e]6,800	[e]21,800	8,600	26,100	9,700	31,000
Industrial	metric tons	749,000	19,000	699,000	18,100	812,000	19,600
Stone (crushed)	thousand metric tons	19,800	121,000	[4]20,000	[4]128,000	[4]1,400	[4]140,000
Combined vvalue of cement (masonry), clays [kaolin (1994)], gemstones, gold, manganiferous ore, mica (scrap), peat, silver, stone [crushed marble (1994-95), dimension (1993, 1995), dimension granite (1994)], and vermiculite		XX	88,700	XX	87,700	XX	85,100
Total		XX	391,000	XX	433,000	XX	426,000

[e]Estimated. [p]Preliminary. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.
[4]Excludes certain stones; kind and value included with "Combined value" data.

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Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 2
SOUTH CAROLINA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Macadam[3]	1,600	$9,570	$5.97
Coarse aggregate, graded:			
Concrete aggregate, coarse	2,100	14,500	6.89
Bituminous aggregate, coarse	2,490	17,000	6.85
Bituminous surface-treatment aggregate	W	W	6.55
Railroad ballast	W	W	7.65
Other graded coarse aggregate	W	W	1.10
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	5.67
Stone sand, bituminous mix or seal	W	W	6.64
Screening, undesignated	246	799	3.25
Other fine aggregate	W	W	9.45
Coarse and fine aggregates:			
Graded road base or subbase	W	W	5.30
Crusher run or fill or waste	W	W	5.43
Other coarse and fine aggregates	W	W	5.87
Other construction materials	4,580	27,100	5.93
Chemical and metallurgical: Cement manufacture	(4)	(4)	9.81
Unspecified:[5]			
Actual	(4)	(4)	5.75
Estimated	22	142	6.45
Total	20,000	128,000	6.39

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes calcareous marl, dolomite, granite, limestone, and shell; excludes marble from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes riprap and jetty stone and other coarse aggregate.
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
SOUTH CAROLINA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5	W	W	$5.38	6	W	W	$5.41
Dolomite	1	W	W	6.08	—	—	—	—
Calcareous marl	3	2,890	$16,100	5.59	3	3,220	$21,500	6.69
Shell	1	W	W	4.59	—	—	—	—
Granite	22	14,300	90,600	6.34	21	15,200	97,600	6.43
Marble	—	—	—	—	(2)	(2)	(2)	(2)
Total	XX	19,800	121,000	6.12	XX	20,000	128,000	6.39

W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes marble from State total to avoid disclosing company proprietary data.

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TABLE 4

SOUTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	4,240	$15,200	$3.60
Plaster and gunite sands	68	390	5.74
Concrete products (blocks, brick, pipe, decorative, etc.)	415	1,200	2.90
Asphaltic concrete aggregates and other bituminous mixtures	500	1,350	2.71
Road base and coverings[2]	210	634	3.01
Fill	931	1,760	1.89
Filtration	49	230	4.69
Other[3]	994	2,050	2.06
Unspecified:[4]			
Actual	523	1,420	2.71
Estimated	671	1,810	2.70
Total or average	8,600	26,100	3.04

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement) and snow and ice control.
[3]Includes railroad ballast.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

SOUTH CAROLINA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

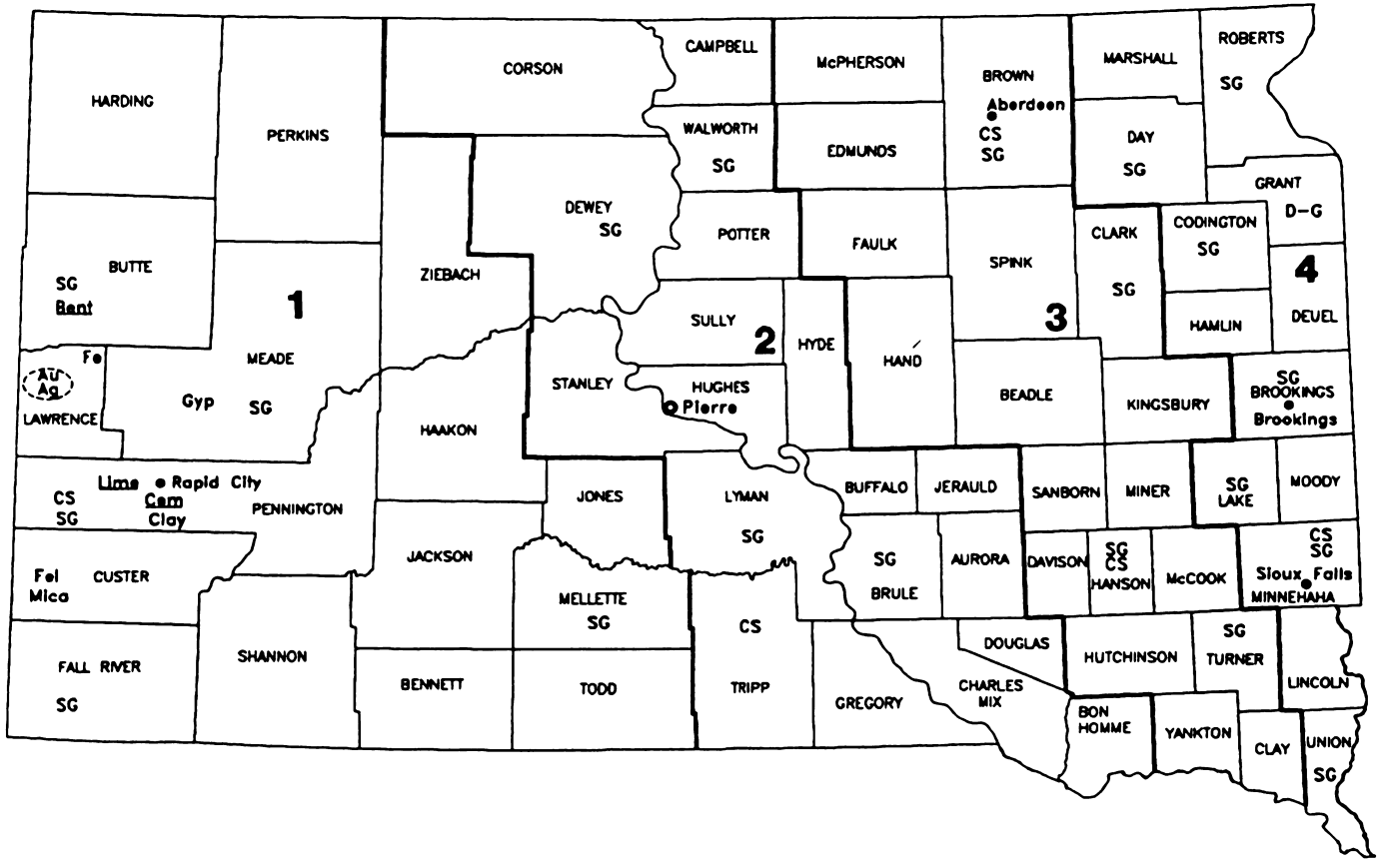
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	255	983	1,730	5,970	2,740	9,890
Asphaltic concrete aggregates and road base materials[3]	260	939	443	786	938	2,030
Other miscellaneous uses[4]	77	298	—	—	966	1,980
Unspecified:[5]						
Actual	—	—	524	1,420	—	—
Estimated	2	7	132	376	537	1,430
Total	594	2,230	2,830	8,550	5,180	15,300

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, road and other stabilization (cement), and snow and ice control.
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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SOUTH DAKOTA



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Au	Gold
Bent	Bentonite mill
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-G	Dimension Granite
Fe	Iron
Fel	Feldspar
Gyp	Gypsum
Lime	Lime plant
Mica	Mica
SG	Sand and Gravel

Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF SOUTH DAKOTA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the South Dakota Geological Survey for collecting information on all nonfuel minerals.

South Dakota remained 36th in the Nation in nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $317 million, a 2% decrease from that of 1994. This followed a more than 4% decrease from 1993 to 1994 (based on final data). The State accounted for almost 1% of the U.S. total nonfuel mineral production value.

The small decreases in value the past 2 years follow South Dakota's all time high of $337 million, set in 1993. Gold remained the State's leading nonfuel mineral by value; the quantity and value have been withheld since 1994 to protect company proprietary data. Whereas the value of gold decreased in 1994 and 1995, the value of portland cement, the State's second-leading mineral commodity, increased in both years. In descending order of value, gold and portland cement were followed by crushed stone, construction sand and gravel, and dimension stone. Compared with 1994, other nonfuel mineral values that increased were dimension stone, lime, iron ore, mica, masonry cement, and gemstones. Values that decreased were crushed stone, construction sand and gravel, silver, and feldspar.

Compared with USGS estimates of the quantities produced in the other 49 States during 1995, South Dakota remained fourth of 14 U.S. gold-producing States, fifth in iron ore, and seventh in feldspar. The State moved down in rank from seventh to eighth in the production of dimension stone and from fourth to fifth in crude mica. Additionally, significant quantities of construction sand and gravel were produced from the State's mine pits. Iron ore was mined mainly for use by a South Dakota cement company as an ingredient in its cement manufacturing process.

According to the South Dakota Geological Survey[2] (SDGS), companies receiving exploration permits for gold and silver were Western Mining Corp., Wharf Resources, Golden Reward Mining Co., Calumet Slag, and Rem Co. The State Board of Minerals and Environment (BME) awarded permits to Creek Gold for exploration of gold, tantalite, almandite, garnet, and sand and gravel, and to Homestake Mining Co. for all minerals excluding uranium.

LAC Minerals Ltd.'s Richmond Hill heap leach gold mine was closed in 1995, with 3.2 million metric tons of acid-generating waste rock being returned to the pit and capped. Vadose zone monitoring equipment was

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN SOUTH DAKOTA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$163	NA	$110	NA	$173
Gold[3]	kilograms	19,200	223,000	W	W	W	W
Sand and gravel (construction)	thousand metric tons	e8,300	e25,000	7,700	23,700	6,600	21,100
Silver[3]	metric tons	5	651	4	696	4	707
Stone (crushed)[4]	thousand metric tons	4,230	18,700	5,470	24,500	5,400	24,300
Combined value of cement, clays (common), feldspar, gypsum [crude (1993)], iron ore (usable), lime, mica (scrap), stone [crushed sandstone and miscellaneous (1993), crushed miscellaneous (1994-95), dimension (1993, 1995), dimension granite (1994)], and values indicated by symbol W		XX	69,400	XX	274,000	XX	270,000
Total		XX	337,000	XX	323,000	XX	317,000

eEstimated. pPreliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Recoverable content of ores, etc.

[4]Excludes certain stones; kind and value included with "Combined value" data.

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installed. The company installed a state-of-the-art acid mine drainage (AMD) water treatment plant with a secondary selenium removal system.

Brohm Mining was also very active on the environmental reclamation front. In March, the BME awarded the company a permit to conduct its acid mine drainage plan at the Gilt Edge Mine. Nine million metric tons of acid-generating waste were capped in Ruby Gulch with a multimedia cover. Brohm's new AMD water treatment plant began operation in September. The company also completed a multiyear, $450,000 reclamation of abandoned, acid-generating tailings along Strawberry Creek. The project represents one of the most successful abandoned mine cleanups in the Black Hills. Strawberry Creek and Bear Butte Creek watersheds have shown significant improvement in water quality and aquatic habitats.

Homestake Mining Co. reached a major milestone, producing its 12 millionth kilogram (38 millionth troy ounce) of gold during November. The company estimated that it would produce more than 12,000 kilograms (about 400,000 troy ounces) of gold in 1995, according to the State Department of Environment and Natural Resources' (DENR) Minerals and Mining Program staff.

Wharf Resources, 60% owner of the Golden Reward Mine, announced in December that it is taking a $9.5 million after-tax write-down of its investment in Golden Reward. This is because of uncertainty of ore reserves near the Terry Cemetery and Terry Peak ski area. This write-down represents Wharf's share of 9,770 kilograms (314,000 troy ounces) of gold in reserves in the cemetery and the ski area. Mining on permitted reserves was projected to end October 1996. The company planned to put the mine on a care and maintenance basis at that time.

A proposed inventory and cleanup of abandoned mines in the Black Hills made some significant advances during the year. DENR officials entered into a Memorandum of Understanding with the U.S. Environmental Protection Agency (EPA) that provides the State and its agents protection from the Comprehensive Environmental Response, Compensation, and Liability Act (the "Superfund" Law) while conducting inventory and cleanup operations. Affected mines exist on both private and public lands throughout the Black Hills region.

A representative of the DENR's Minerals and Mining Program presented EPA-sponsored seminars in Anaconda, MT, Denver, CO, and Sacramento, CA, on acid mine drainage (AMD). The seminars detailed the AMD efforts at Richmond Hill and Gilt Edge Mines and the Strawberry Creek relic tailing cleanup of the northern Black Hills.

Budget reductions in the South Dakota State Government may have some impact on minerals' activities in DENR. Nineteen of 21 agencies, including DENR, will be downsized by about 9% under the Governor's 1997 budget proposal. The Minerals and Mining Program was slated to lose one of its two hydrologists while the SDGS will discontinue several functions, including its water chemistry lab, minerals lab, minerals investigations, natural resources education activities, and aid to economic development. Three full-time and two seasonal positions will be eliminated at SDGS.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the South Dakota Geological Survey.

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TABLE 2

SOUTH DAKOTA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse and fine aggregates[3]	1,250	$6,000	$4.79
Chemical and metallurgical:			
Cement manufacture	(4)	(4)	1.49
Lime manufacture	(4)	(4)	4.52
Glass manufacture	(4)	(4)	22.00
Unspecified:[5]			
Actual	2,460	13,600	5.52
Estimated	600	2,680	4.46
Total	5,470	24,500	4.47

[1]Includes limestone and quartzite; excludes miscellaneous stone from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes bituminous aggregate (coarse), bituminous surface-treatment aggregate, concrete aggregate (coarse), crusher run or fill or waste, filter stone, graded road base or subbase, other coarse aggregate, railroad ballast, stone sand (bituminous mix or seal), and stone sand (concrete).
[4]Withheld to avoid disclosing company proprietary data; included in "Total."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

SOUTH DAKOTA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993[2]				1994[3]			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	5	2,580	$9,020	$3.49	5	2,850	$9,520	$3.34
Quartzite	4	1,650	9,670	5.87	5	2,620	15,000	5.70
Total	XX	4,230	18,700	4.42	XX	5,470	24,500	4.47

XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes miscellaneous stone and sandstone from State total to avoid disclosing company proprietary data.
[3]Excludes miscellaneous stone from State total to avoid disclosing company proprietary data.

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TABLE 4

SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	1,040	$5,230	$5.05
Asphaltic concrete aggregates and other bituminous mixtures	432	1,740	4.03
Road base and coverings[3]	2,910	7,220	2.48
Fill	461	905	1.96
Snow and ice control	23	120	5.22
Railroad ballast	34	175	5.15
Other	11	50	4.55
Unspecified:[4]			
Actual	1,530	4,560	2.98
Estimated	1,260	3,730	2.96
Total or average	7,700	23,700	3.08

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

SOUTH DAKOTA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

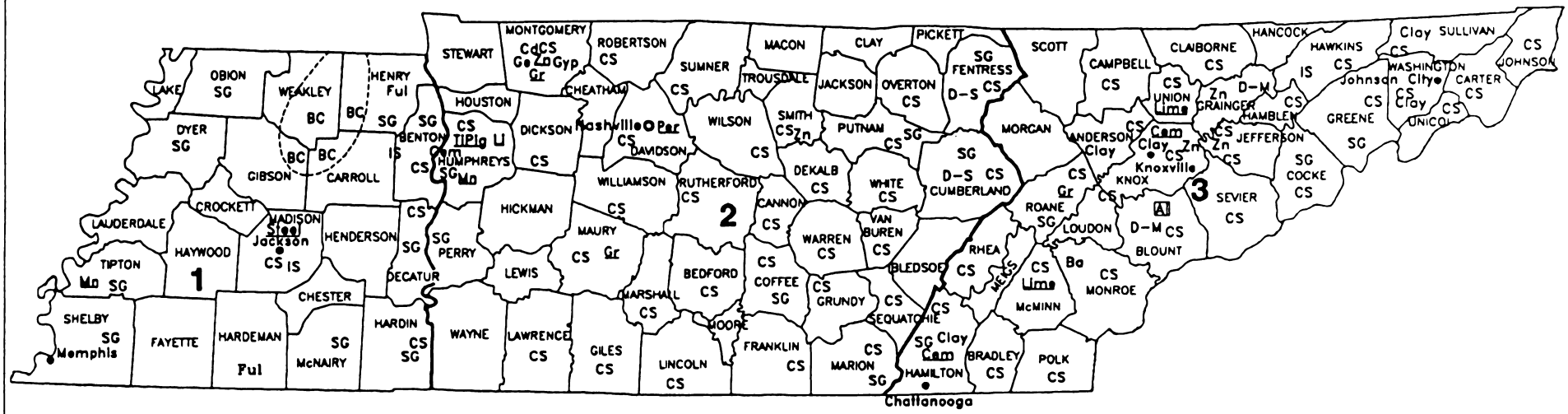
Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	368	1,910	122	665
Asphaltic concrete aggregates and road base materials[3]	398	757	642	1,650
Snow and ice control	7	62	—	—
Railroad ballast	—	—	—	—
Other miscellaneous uses[4]	—	—	—	—
Unspecified:[5]				
Actual	88	225	129	215
Estimated	316	966	197	565
Total	1,180	3,920	1,090	3,100
	District 3		District 4	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	167	836	379	1,820
Asphaltic concrete aggregates and road base materials[3]	872	2,670	1,890	4,790
Snow and ice control	1	3	15	55
Railroad ballast	27	149	6	26
Other miscellaneous uses[4]	—	—	11	50
Unspecified:[5]				
Actual	427	1,090	888	3,040
Estimated	352	1,080	391	1,110
Total	1,850	5,820	3,580	10,900

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, road, and other stabilization (cement).
[4]Includes filtration and roofing granules.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TENNESSEE



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Al	Aluminum plant	CS	Crushed Stone	Gyp	By Product Gypsum	SG	Sand and Gravel
Ba	Barite	D-M	Dimension Marble	IS	Industrial Sand	Steel	Steel Plant
BC	Ball Clay	D-S	Dimension Sandstone	Li	Lithium plant	TiPig	Titanium Dioxide pigment plant
Cem	Cement plant	Ful	Fuller's earth	Lime	Lime plant	Zn	Zinc
Clay	Clay	Gem	Freshwater Pearls & Shells	Mn	Manganese Dioxide plant	Zn	Zinc refinery (Cd By-product Cadmium) (Ge By-product Germanium)
		Gr	Graphite plant	Par	Perlite plant		

Concentration of mineral operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF TENNESSEE

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Tennessee Division of Geology for collecting information on all nonfuel minerals.

In 1995, Tennessee ranked 18th for the 4th time in the past 5 years among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was more than $659 million, an 18% increase from that of 1994. This followed an 18% increase from 1993 to 1994 (based on final data). The State accounted for a little less than 2% of the U.S. total nonfuel mineral production value.

Crushed stone and zinc, by value the State's leading mineral commodities, provided large portions of Tennessee's increased nonfuel mineral value in both 1994 and 1995. In 1995, a significant increase in gemstone value and moderate increases in portland cement and fuller's earth clays accounted for most of the remainder of the year's increase. Crushed stone has been Tennessee's leading commodity for more than 25 years, except for 1981 when zinc was first. In 1995, crushed stone accounted for about 44% of the State's total nonfuel mineral production value. Compared with 1994, other mineral commodities that increased in value in 1995 were ball clays, lime, industrial sand and gravel, masonry cement, silver, and copper. Decreases occurred in construction sand and gravel, dimension stone, common clays, and barite.

Compared with USGS estimates of the quantities produced in the other 49 States, Tennessee remained the leading gemstone- and ball clay-producing State, second in zinc, and seventh in fuller's earth. While the State increased from 11th to 10th in the production of crushed stone, Tennessee's minerals industry produced significant quantities of portland and masonry cement, construction and industrial sand and gravel, and lime. The State ranked 10th in the production of primary aluminum, which was processed from raw materials received from foreign sources.

The Tennessee Division of Geology (TAG)[2] reported that the State's zinc mining industry had another active year in 1995. ASARCO Incorporated's east Tennessee zinc mining operations continued on a 7-day workweek at four mines. Approximately 70,000 metric tons (155 million pounds) of zinc concentrate was produced and a record 270,000 metric tons (300,000 short tons) of agricultural limestone was shipped.

Savage Zinc Co., a U.S. subsidiary of Savage

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN TENNESSEE[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	607	$25,700	665	$28,600	653	$29,300
Gemstones		NA	21,800	NA	23,100	NA	35,400
Sand and Gravel							
Construction	thousand metric tons	7,200	34,000	8,710	38,000	7,600	33,400
Industrial	metric tons	644,000	11,700	660,000	11,600	768,000	13,200
Stone:							
Crushed	thousand metric tons	43,500	227,000	49,200	265,000	52,200	287,000
Dimension	metric tons	4,550	552	W	W	W	W
Combined value of barite (1994-95), cement, clays [bentonite (1993-94), common, fuller's earth], copper, lead (1993-94), lime, silver, zinc, and values indicated by symbol W		XX	189,000	XX	235,000	XX	261,000
Total		XX	510,000	XX	602,000	XX	659,000

'Estimated. [p]Preliminary. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

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Resources Ltd. (Australia), continued operation of the Gordonsville-Elmwood-Cumberland mining and milling complex in middle Tennessee and the electrolytic refinery in Clarksville. Savage also operates the Jefferson City Mine and mill and the Clinch Valley Mine and mill (formerly named the Idol Mine), two zinc mines in eastern Tennessee.

Short Mountain Silica Co., of Mooresburg, continued as a major producer of glass sand as well as sand for a variety of other uses.

In the Coker Creek gold district of Monroe County in east Tennessee, the East Coast Prospectors Club, headquartered in Ellijay, GA, continued to maintain leases on two tracts of land where members mine placer gold using portable dredges and pans. In addition, Coker Creek Village operated a pan-for-fee operation for naturally occurring placer gold.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the TAG.

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TABLE 2

TENNESSEE: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	64	$282	$4.41
Riprap and jetty stone	1,340	6,820	5.11
Filter stone	367	1,810	4.94
Other coarse aggregate	139	656	4.72
Coarse aggregate, graded:			
Concrete aggregate, coarse	4,000	19,200	4.80
Bituminous aggregate, coarse	11,100	56,000	5.06
Bituminous surface-treatment aggregate	2,280	14,800	6.50
Railroad ballast	355	1,570	4.42
Other graded coarse aggregate	1,060	5,660	5.33
Fine aggregate (-3/8 inch):			
Stone sand, concrete	738	5,420	7.34
Stone sand, bituminous mix or seal	556	2,720	4.88
Screening, undesignated	2,830	15,700	5.54
Other fine aggregate	W	W	4.88
Coarse and fine aggregates:			
Graded road base or subbase	11,300	55,800	4.95
Unpaved road surfacing	562	2,980	5.30
Terrazzo and exposed aggregate	W	W	4.57
Crusher run or fill or waste	1,980	8,490	4.29
Other coarse and fine aggregates	817	4,140	5.07
Other construction materials	1,550	7,540	4.87
Agricultural: Agricultural limestone[3]	(4)	(4)	8.04
Chemical and metallurgical:			
Cement manufacture	(4)	(4)	5.17
Lime manufacture	(4)	(4)	16.50
Glass manufacture	(4)	(4)	9.88
Sulfur oxide removal	(4)	(4)	4.20
Special:			
Mine dusting or acid water treatment	(4)	(4)	21.20
Asphalt fillers or extenders	(4)	(4)	8.55
Whiting or whiting substitute	(4)	(4)	11.00
Other fillers or extenders	(4)	(4)	10.90
Other specified uses not listed	4,020	33,000	8.21
Unspecified:[5]			
Actual	2,020	10,700	5.31
Estimated	2,240	12,100	5.42
Total	49,200	265,000	5.39

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, granite, limestone, limestone-dolomite, miscellaneous stone, and sandstone.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes poultry grit and mineral food and other agricultural uses.
[4]Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

TENNESSEE: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r107	38,800	$204,000	$5.26	104	43,500	$237,000	$5.44
Dolomite	9	W	W	4.71	10	W	W	5.00
Granite	1	W	W	4.96	1	W	W	4.96
Sandstone	1	W	W	5.51	1	W	W	5.52
Miscellaneous stone	1	W	W	5.26	1	W	W	5.44
Total	XX	43,500	227,000	5.20	XX	49,200	265,000	5.39

rRevised. W Withheld to avoid disclosing proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to three significant digits.

[2]Includes "Limestone-dolomite" reported with no distinction between the two.

TABLE 4

TENNESSEE: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 2		District 3	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	1,250	5,930	650	3,650
Coarse aggregate, graded[4]	10,000	51,000	8,730	46,200
Fine aggregate (-3/8 inch)[5]	2,250	10,900	2,050	13,800
Coarse and fine aggregate[6]	9,420	42,000	5,890	32,500
Other construction materials	640	3,300	40	225
Agricultural[7]	W	W	W	W
Chemical and metallurgical[8]	W	W	W	W
Special[9]	W	W	W	W
Other miscellaneous uses[10]	2,460	16,400	1,560	16,600
Unspecified[11]				
Actual	1,330	6,840	683	3,860
Estimated	1,070	5,500	1,170	6,630
Total	28,400	142,000	20,800	124,000

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

[1]Production reported in District 1 was included with "District 2" to avoid disclosing company proprietary data.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.

[6]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[7]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.

[8]Includes cement manufacture, glass manufacture, lime manufacture, and sulfur oxide removal.

[9]Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whiting or whiting substitute.

[10]Includes other specified uses not listed.

[11]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

TENNESSEE: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	3,310	$14,500	$4.40
Plaster and gunite sands	122	687	5.63
Concrete products (blocks, brick, pipe, decorative, etc.)	309	1,410	4.57
Asphaltic concrete aggregates and other bituminous mixtures	1,410	7,090	5.05
Road base and coverings[2]	1,570	5,470	3.49
Fill	126	432	3.43
Other[3]	37	288	7.78
Unspecified:[4]			
Actual	542	2,370	4.38
Estimated	1,300	5,700	4.40
Total or average	8,710	38,000	4.36

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement) and snow and ice control.
[3]Includes filtration and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

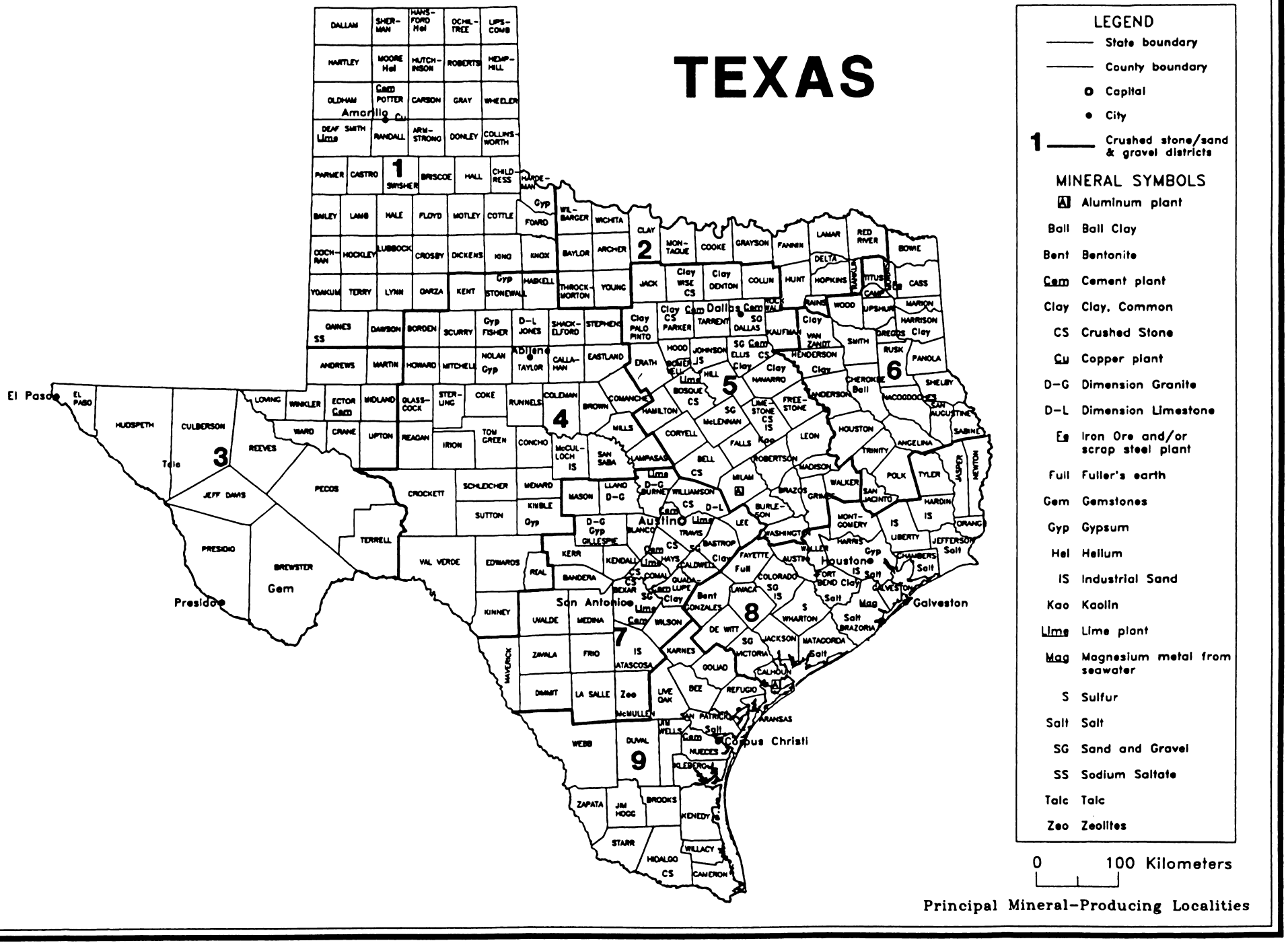
TENNESSEE: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	2,320	9,110	1,420	7,520
Asphaltic concrete aggregates and road base materials[4]	2,350	8,360	749	4,630
Other miscellaneous uses[5]	—	—	37	289
Unspecified:[6]				
Actual	360	1,420	182	953
Estimated	974	3,980	322	1,730
Total	6,010	22,900	2,710	15,100

[1]Production reported in District 3 was included with "District 2" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill, road and other stabilization (cement), and snow and ice control.
[5]Includes filtration and roofing granules.
[6]Includes production reported without a breakdown by end and estimates for nonrespondents.

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TEXAS
LEGEND
State boundary
County boundary
Capital
City
Crushed stone/sand & gravel districts
MINERAL SYMBOLS
Aluminum plant
Ball Ball Clay
Bent Bentonite
Cem Cement plant
Clay Clay, Common
CS Crushed Stone
Cu Copper plant
D-G Dimension Granite
D-L Dimension Limestone
Fe Iron Ore and/or scrap steel plant
Full Fuller's earth
Gem Gemstones
Gyp Gypsum
Hel Helium
IS Industrial Sand
Kao Kaolin
Lime Lime plant
Mag Magnesium metal from seawater
S Sulfur
Salt Salt
SG Sand and Gravel
SS Sodium Salfate
Talc Talc
Zeo Zeolites
0 100 Kilometers
Principal Mineral-Producing Localities
El Paso
Presidio
San Antonio
Austin
Houston
Galveston
Corpus Christi
Amarillo
Abilene
Dallas
1
2
3
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10

THE MINERAL INDUSTRY OF TEXAS

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Bureau of Economic Geology, The University of Texas at Austin, for collecting information on all nonfuel minerals.

Texas ranked sixth in the Nation in total nonfuel mineral production value[1] in 1995, down from fifth in 1994, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was more than $1.6 billion, an 8% increase from that of 1994. This followed a 7.5% increase in 1994 from 1993 (based on final 1994 data). The State accounted for more than 4% of the U.S. total nonfuel mineral production value.

About 85% of the State's nonfuel mineral value came from industrial minerals, especially portland cement, crushed stone, construction sand and gravel, salt, and lime. Crushed stone production in Texas increased by about 10% in 1995 from that of 1994. Likewise, salt production increased by 35% and portland cement by 4%. These three mineral commodities combined accounted for almost 70% of the State's total rise in the production value of nonfuel minerals. Additionally, a 35% increase in Frasch sulfur production and a 12% increase in lime production accounted for a lesser, yet substantial, portion of the increase in mineral production value for Texas in 1995. Compared with 1994, the following nonfuel mineral values also increased: construction sand and gravel, magnesium metal, grade-A helium, common clays, talc and pyrophyllite, crude helium, ball clays, and bentonite clays. The value of the following mineral commodities decreased: industrial sand and gravel, masonry cement, dimension stone, crude

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN TEXAS[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement:							
Masonry	metric tons	245,000	$18,400	258,000	$18,200	225,000	$15,900
Portland	do.	8,130,000	398,000	8,620,000	456,000	8,990,000	475,000
Clays[3]	thousand metric tons	2,180	17,400	2,190	13,700	2,410	17,700
Gemstones		NA	400	NA	448	NA	352
Gypsum (crude)	thousand metric tons	1,760	10,100	1,870	10,100	1,890	9,360
Helium (crude)	million cubic meters	6	5,390	7	7,050	7	7,330
Lime	thousand metric tons	1,370	86,400	1,210	76,200	1,360	87,200
Salt	do.	8,250	76,100	8,760	[r]76,500	11,800	99,700
Sand and gravel:							
Construction	do.	47,100	[e]195,000	56,700	242,000	55,600	245,000
Industrial	metric tons	1,430,000	28,600	1,570,000	37,900	1,540,000	37,400
Stone (crushed)	thousand metric tons	70,800	279,000	76,100	300,000	83,600	343,000
Sulfur (Frasch)	do.	1,160	W	W	W	W	W
Talc and pyrophyllite	metric tons	236,000	5,660	225,000	5,860	286,000	7,600
Combined value of clays (ball, bentonite, fuller's earth, kaolin), fluorspar (1993), helium (Grade-A), iron ore (usable), magnesium compounds, magnesium metal, sodium sulfate (natural), stone [dimension (1993, 1995), dimension granite and limestone (1994)], and values indicated by symbol W		XX	311,000	XX	295,000	XX	316,000
Total		XX	1,430,000	XX	1,540,000	XX	1,660,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

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gypsum, kaolin clays, sodium sulfate, fuller's earth clays, magnesium compounds, gemstones and iron ore.

Based on USGS estimates of the quantities of mineral produced in the 50 States in 1995, Texas climbed in rank from 2d to 1st in crushed stone, 8th to 7th in dimension stone, 9th to 8th in kaolin, and 11th to 9th in fuller's earth. The State remained first in the production of magnesium metal, second of two sodium sulfate-producing States, as well as second in portland cement, construction sand and gravel, salt, Frasch sulfur, zeolites, talc and pyrophyllite, crude helium, and ball clays. Texas continued to rank third in grade-A helium and crude gypsum; sixth in industrial sand and gravel, magnesium compounds, and iron ore; and seventh in bentonite. While Texas was one of the top six States in the production of lime and the top nine in masonry cement, the State dropped from second to third in common clay production.

Magnesium metal, extracted from seawater, was the only metal produced from the State's natural resources. Very small quantities of iron ore were mined for industrial use as a cattle feed nutrient, road aggregate, and in the manufacture of cement. In addition to the production of magnesium metal, the Texas metals industry produced raw steel, primary aluminum, copper, lead, and smaller amounts of other metals. Sources of plant feed included scrap metal and ores acquired from other domestic or foreign sources. Texas was among the top seven State's that produced raw steel, with an estimated output of nearly 3.9 million metric tons (4.3 million short tons), as reported by the American Iron and Steel Institute. The State ranked ninth in primary aluminum production.

According to the Texas Bureau of Economic Geology (TBEG), the pattern of declining employment rates that emerged in late 1994 in the mining and oil and gas industries continued through 1995. The November 1995 unemployment rate (seasonally adjusted) was 6% compared with 5.7% for November 1994. Employment in the Texas mining industry decreased from 161,500 in October 1994 to 155,400 in October 1995. Oil and gas industry employment fell from 153,500 to 147,300 during the same period.

In other minerals industry-related matters, a bill requiring registration of geologists in the State did not survive the 1995 Texas Legislature. Geologists who sponsored the bill planned to resubmit it to the 75th Legislature in 1997. Lastly, TBEG was in the process of revising its mineral producers list for Texas. The project is scheduled for completion by mid-1996.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

TEXAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	$8.13
Riprap and jetty stone	536	$3,410	6.36
Filter stone	196	993	5.07
Other coarse aggregate	W	W	8.87
Coarse aggregate, graded:			
Concrete aggregate, coarse	13,500	63,900	4.74
Bituminous aggregate, coarse	7,470	35,400	4.73
Bituminous surface-treatment aggregate	1,370	6,260	4.57
Railroad ballast	488	2,560	5.24
Other graded coarse aggregate	W	W	7.71
Fine aggregate (-3/8 inch):			
Stone sand, concrete	2,310	9,730	4.22
Stone sand, bituminous mix or seal	2,160	7,150	3.31
Screening, undesignated	999	2,750	2.75
Other fine aggregate	W	W	4.41
Coarse and fine aggregates:			
Graded road base or subbase	21,500	63,600	2.95
Unpaved road surfacing	170	813	4.78
Terrazzo and exposed aggregate	6	280	46.70
Crusher run or fill or waste	2,660	6,150	2.31
Other coarse and fine aggregates	W	W	4.00
Other construction materials[3]	833	4,330	5.20
Agricultural:			
Agricultural limestone	(4)	(4)	3.48
Poultry grit and mineral food	(4)	(4)	9.73
Other agricultural uses	(4)	(4)	4.19
Chemical and metallurgical:			
Cement manufacture	10,700	25,600	2.40
Lime manufacture	2,780	11,600	4.19
Flux stone	(4)	(4)	5.18
Chemical stone	(4)	(4)	3.93
Sulfur oxide removal	(4)	(4)	3.99
Special:			
Asphalt fillers or extenders	(4)	(4)	11.60
Whiting or whiting substitute	(4)	(4)	11.60
Other fillers or extenders	1,060	20,800	19.60
Other specified uses not listed	1,290	6,800	5.26
Unspecified:[5]			
Actual	805	2,920	3.62
Estimated	5,310	25,400	4.79
Total	76,100	300,000	3.95

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes calcareous marl, dolomite, granite, limestone, marble, miscellaneous stone, sandstone, traprock, and volcanic cinder and scoria.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes roofing granules.

[4]Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

TEXAS: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r127	r66,900	r$258,000	r$3.86	109	72,000	$285,000	$3.96
Dolomite	r1	W	W	3.05	1	W	W	2.84
Marble	20	W	W	W	20	W	W	W
Calcareous marl	2	W	W	3.11	2	W	W	1.76
Granite	14	25	W	W	14	4	W	W
Traprock	3	250	1,810	7.23	3	413	2,820	6.83
Sandstone	6	825	5,270	6.39	5	524	3,840	7.33
Quartzite	1	W	W	8.42	—	—	—	—
Volcanic cinder and scoria	1	W	W	4.20	1	W	W	5.47
Miscellaneous stone	r9	r1,760	r5,320	r3.03	7	1,500	4,530	3.03
Total	XX	r71,700	r281,000	r3.92	XX	76,100	300,000	3.95

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Previously published and 1994 data are rounded to three significant digits, may not add to totals shown.

TABLE 4

TEXAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 4		District 5	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	—	—	W	W	W	W
Coarse aggregate, graded[4]	—	—	W	W	10,200	50,300
Fine aggregate (-3/8 inch)[5]	—	—	W	W	W	W
Coarse and fine aggregate[6]	(7)	(7)	2,460	7,470	4,510	18,100
Other construction materials[8]	—	—	898	5,530	2,140	7,560
Agricultural[9]	—	—	(7)	(7)	(10)	(10)
Chemical and metallurgical[11]	—	—	(7)	(7)	6,640	20,400
Special[12]	—	—	—	—	(10)	(10)
Other miscellaneous uses[13]	—	—	—	—	942	9,440
Unspecified:[14]						
Actual	—	—	8	9	241	1,080
Estimated	(7)	(7)	2,500	12,400	1,830	8,470
Total	322	1,590	7,460	30,300	26,500	115,000

See footnotes at end of table.

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TABLE 4—Continued

TEXAS: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 7		District 9	
	Quantity	Value	Quantity	Value
Construction aggregates:				
Coarse aggregate (+1 1/2 inch)[3]	499	2,580	—	—
Coarse aggregate, graded[4]	11,600	52,500	(7)	(7)
Fine aggregate (-3/8 inch)[5]	3,500	13,100	—	—
Coarse and fine aggregate[6]	16,400	43,200	(7)	(7)
Other construction materials[8]	305	1,240	—	—
Agricultural[9]	(7)	(7)	—	—
Chemical and metallurgical[11]	6,290	16,600	—	—
Special[12]	(7)	(7)	—	—
Other miscellaneous uses[13]	—	—	—	—
Unspecified:[14]				
Actual	556	1,830	—	—
Estimated	547	2,710	179	470
Total	40,400	149,000	1,480	3,910

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Production reported in District 2 and 3 was included with "District 4;" District 6 and 8 was included with "District 5" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Withheld to avoid disclosing company proprietary data; included in "Total."
[8]Includes roofing granules.
[9]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[10]Included with "Other miscellaneous uses."
[11]Includes cement manufacture, chemical stone for alkali works, flux stone, lime manufacture, and sulfur oxide removal.
[12]Includes asphalt fillers or extenders, other fillers or extenders, and whiting or whiting substitute.
[13]Includes other specified uses not listed.
[14]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

TEXAS: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	23,000	$110,000	$4.81
Plaster and gunite sands	348	1,910	5.50
Concrete products (blocks, brick, pipe, decorative, etc.)	327	1,200	3.67
Asphaltic concrete aggregates and other bituminous mixtures	2,130	12,300	5.78
Road base and coverings[2]	3,390	13,100	3.88
Fill	7,510	13,100	1.75
Other[3]	275	858	3.12
Unspecified:[4]			
Actual	5,940	29,200	4.92
Estimated	13,800	59,600	4.31
Total or average	56,700	242,000	4.26

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes filtration, railroad ballast, and roofing granules.
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

TEXAS: CONSTRUCTION SAND AND GRAVEL[1] SOLD OR USED IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 3		District 4	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	1,350	9,290	1,700	8,000	235	1,650
Asphaltic concrete aggregates and road base materials[4]	1,010	5,800	(5)	(5)	(5)	(5)
Other miscellaneous uses[7]	—	—	(5)	(5)	(5)	(5)
Unspecified:[8]						
Actual	48	216	—	—	128	943
Estimated	805	3,400	113	476	934	5,040
Total	3,210	18,700	2,550	12,200	1,360	7,950

	District 5		District 6		District 7	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	4,920	29,800	—	—	2,430	9,940
Asphaltic concrete aggregates and road base materials[4]	3,160	7,760	33	144	1,270	2,530
Other miscellaneous uses[7]	235	584	—	—	31	213
Unspecified:[8]						
Actual	3,110	16,800	292	1,150	1,990	9,450
Estimated	4,510	17,500	639	3,890	1,400	6,430
Total	15,900	72,400	963	5,190	7,120	28,600

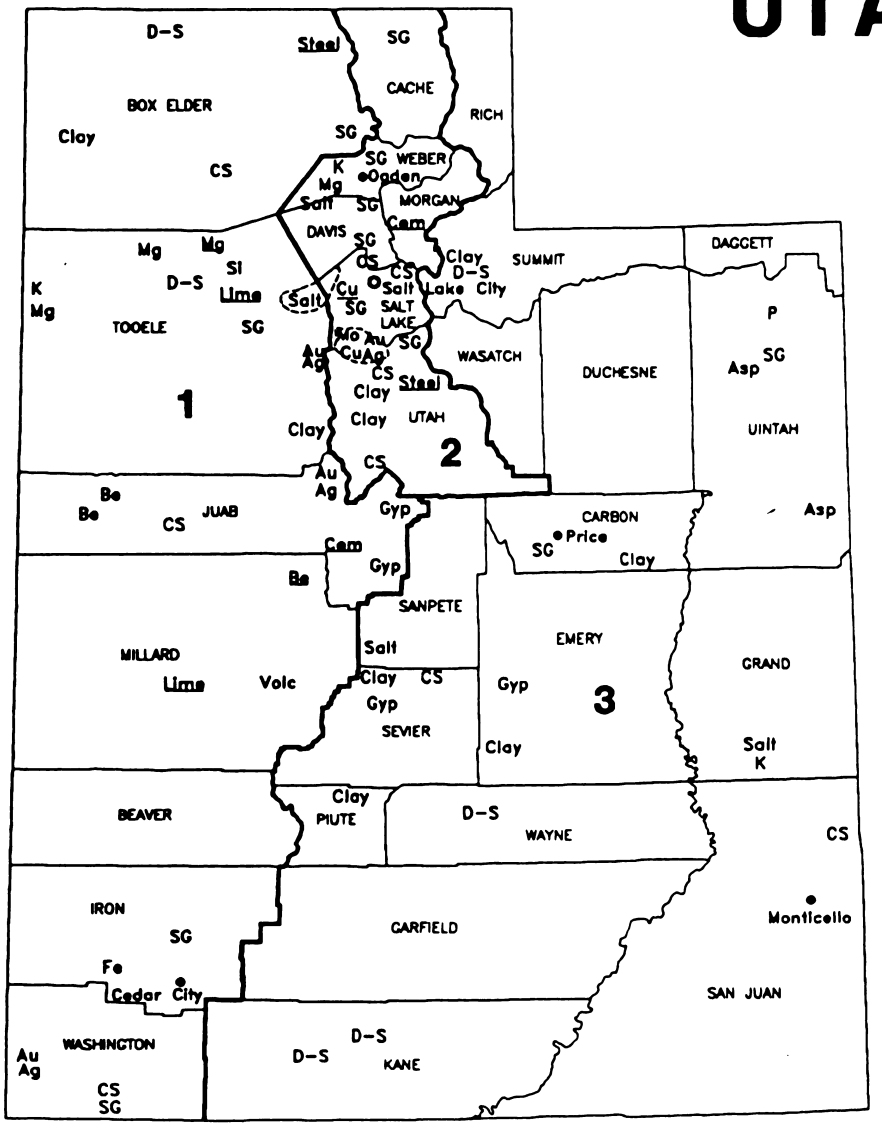
	District 8		District 9	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[3]	10,800	42,400	2,230	12,500
Asphaltic concrete aggregates and road base materials[4]	6,020	13,900	[6]752	[6]4,390
Other miscellaneous uses[7]	—	—	—	—
Unspecified:[8]				
Actual	378	651	—	—
Estimated	4,350	18,000	1,080	4,870
Total	21,500	75,000	[6]4,060	[6]21,800

[1]Production reported in District 2 was included with "District 3" to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes plaster and gunite sands.
[4]Includes fill, road and other stabilization (cement and lime).
[5]Withheld to avoid disclosing company proprietary data; included with "Total."
[6]Includes unspecified within all districts.
[7]Includes filtration, railroad ballast, and roofing granules.
[8]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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UTAH



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Asp	Asphaltite
Au	Gold
Be	Beryllium
Be	Beryllium plant
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
Cu	Copper
Cu	Copper plant
D-S	Dimension Sandstone
Fe	Iron
Gyp	Gypsum
K	Potash
Lime	Lime plant
Mg	Magnesium
Mg	Magnesium metal plant
Mo	Molybdenum
P	Phosphate rock
Salt	Salt
SG	Sand and Gravel
SI	Silica
Steel	Iron and Steel plant
Volc	Volcanic cinders
	Concentration of mineral operations

0 — 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF UTAH

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Utah Geological Survey for collecting information on all nonfuel minerals.

In 1995, Utah ranked fourth nationally in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The State has climbed in rank during the past several years, having been seventh in 1992-93 and sixth in 1994. The estimated value for 1995 exceeded $1.8 billion, an increase of almost 21% compared with that of 1994. This followed a 16% increase from 1993 to 1994 (based on final 1994 data). The State accounted for nearly 5% of the U.S. total nonfuel mineral production value.

Metals accounted for about four-fifths of Utah's mineral value, copper being about 65% of the State's entire metal value. Increases in Utah's mineral value in 1992 and 1994-95 were mostly caused by higher prices and increased production and sales of copper. In 1993, copper had a similar degree of impact, but as a decrease. Compared with 1994, the values of the following mineral commodities increased in 1995: copper, magnesium metal, molybdenum, salt, potash, silver, phosphate rock, magnesium compounds, iron ore, common clays, grade-A helium, gypsum (crude), gemstones, industrial sand and gravel, masonry cement, and beryllium concentrates. The value of the following decreased: gold, portland cement, construction sand and gravel, lime, crushed stone, and bentonite clays.

Based on USGS estimates of the quantities of minerals produced in the United States during 1995, Utah remained second in copper; second of four potash-producing States; third in gold, magnesium metal, molybdenum, and mercury; fourth in silver, phosphate rock, magnesium compounds, and iron ore; and sixth in salt. Utah climbed from 10th to 8th in

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN UTAH[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Beryllium concentrates	metric tons	4,940	$5	4,330	$5	5,630	$6
Clays[3]	thousand metric tons	216	3,130	243	3,410	348	3,850
Gemstones		NA	1,160	NA	620	NA	826
Potash (K_2O)	thousand metric tons	r182	r48,400	W	W	W	W
Salt	do.	2,250	46,800	1,680	56,700	2,400	83,400
Sand and gravel:							
Construction	do.	e16,000	e56,000	21,100	69,600	18,000	61,200
Industrial	metric tons	—	—	—	—	90,700	800
Silver[4]	do.	135	18,700	W	W	W	W
Stone (crushed)	thousand metric tons	4,560	29,400	4,540	19,800	4,300	19,000
Combined value of cement, clays [bentonite, fuller's earth (1993)], copper, gold, gypsum (crude), helium (Grade-A), iron ore (usable), lime, magnesium compounds, magnesium metal, mercury, molybdenum, phosphate rock, sodium sulfate (natural), stone [dimension (1993, 1995), dimension quartzite and sandstone (1994)], and values indicated by symbol W		XX	1,110,000	XX	1,370,000	XX	1,670,000
Total		XX	1,310,000	XX	1,520,000	XX	1,840,000

eEstimated. pPreliminary. rRevised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

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gemstone production (based on value), remained the only State to produce beryllium ore, and was one of five States that produced grade-A helium. Utah mines and manufacturing plants produced substantial quantities of portland cement, construction sand and gravel, lime, and dimension stone. Additionally, industrial sand and gravel mining was resumed in 1995, and raw steel production continued in the State.

The remainder of this narrative was derived from information provided by the Utah Geological Survey. Mineral exploration in the State slowed significantly in 1995 for the second consecutive year. Mining companies filed 22 Notices of Intent (NOI) to explore during 1995; this compared with 36 for 1994 and 54 for 1993, a more typical year. In 1995, nearly 30% of the NOI's were for industrial rock and minerals, the remainder being mostly for precious metals. Precious metal exploration projects were mostly in Beaver, Tooele, and Box Elder Counties.

Kennecott Utah Copper Corp. completed its $880 million smelter-refinery expansion and modernization project at its Bingham Canyon operation. The new smelter utilizes state-of-the-art flash-smelting and flash-converting techniques. At capacity, Kennecott expects to be able to process nearly 1 million metric tons[2] (1.1 million short tons) of concentrate per year. This is about a 70% increase from previous capacity, making Kennecott self-sufficient for smelting/refining capacity. Kennecott had been exporting large quantities of copper concentrate. The new refinery will increase annual output from 200,000 to 280,000 tons (220,000 to 310,000 short tons) of cathode copper and will lower unit cash costs for refining by an estimated 35%. Additionally, Kennecott claimed the new smelter to be the cleanest in the world, recovering 99.9% of all sulfur dioxide emissions. Kennecott also continued with permitting activities on its $510 million program to expand a tailing pond by 1,400 hectares (3,500 acres) at the Bingham Canyon Mine. As part of the program, the company said it would build a 1,000 hectare (2,500 acre) wildlife preserve to replace affected wetlands. Completion of the tailings pond expansion project was expected by 1997.

In August, Energy Fuels Nuclear Inc. resumed uranium processing activities at its White Mesa mill south of Blanding, San Juan County. The initial milling campaign was scheduled to last about 5 months (August 1995 to January 1996) and was expected to produce about 900 tons (2 million pounds) of U_3O_8 from roughly 180,000 tons (200,000 short tons) of stockpiled ore. The White Mesa mill is the newest (and only) operating uranium mill in the United States. Summo Minerals Corp. announced plans to develop its Lisbon Valley open pit copper mine and heap-leach operation in San Juan County, about 57 kilometers (35 miles) southeast of Moab. Summo will mine 11,000 tons of ore per day (12,000 short tons) from three separate pits. Copper leachate from the heap-leach pad will be processed in a 13,000 liter-per-minute (3,000-gallon-per-minute) solvent extraction electrowinning plant. Minable reserves were reported by the company to be more than 38.6 million tons (42.6 million short tons) at a grade of 0.44% copper. At full capacity, the mine and plant was expected to produce 15,400 tons (34 million pounds) of electrowon cathode copper per year. Mine production was scheduled to begin in April 1997 with initial cathode production scheduled for July.

A joint venture between Chief Consolidated Mining Co. (the operator) and Akiko Gold Resources Ltd. continued exploration at the Burgin lead-zinc-silver mine in the East Tintic District. Revised reserve estimates were being calculated based on underground drilling and sampling. The partners expected total reserves to approach the 1.8 million tons (2 million short tons) needed to begin development. In addition to the lead-zinc-silver ore, a gold-rich zone was discovered that may contain as much as 3,110 kilograms (100,000 troy ounces) of gold. A mine plan was developed and completion of a feasibility study was expected during 1996. A comprehensive feasibility study was necessary because, if reopened, the Burgin Mine will need extensive redevelopment, including a new mine shaft, to make it an economic and efficient modern mining operation.

Centurion Mines Corp. announced a copper-molybdenum discovery at the O.K. Mine northwest of Milford. The company reported calculated ore reserves to be about 1.8 million tons (2 million short tons) at a grade of 0.625% copper and an additional 1.8 million tons at 0.40% copper; the deposit overall contained a grade of about 0.023% molybdenum. Surface trenching and drilling revealed additional copper-molybdenum mineralization significantly beyond the limits of the calculated ore reserves.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from your fax machine and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric tons unless otherwise specified.

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TABLE 2

UTAH: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch): Riprap and jetty stone	W	W	$5.61
Coarse aggregate, graded: Bituminous aggregate, coarse	W	W	3.31
Fine aggregate (-3/8 inch):			
Stone sand, bituminous mix or seal	W	W	3.31
Screening, undesignated	7	$34	4.86
Coarse and fine aggregates:			
Graded road base or subbase	509	1,670	3.28
Unpaved road surfacing	37	183	4.95
Crusher run or fill or waste	W	W	1.10
Other construction materials	1,710	3,220	1.88
Agricultural: Poultry grit and mineral food	(3)	(3)	27.60
Chemical and metallurgical:			
Cement manufacture	(3)	(3)	4.66
Lime manufacture	(3)	(3)	10.10
Flux stone	(3)	(3)	6.37
Unspecified:[4] Estimated	24	127	5.29
Total	4,540	19,800	4.36

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, limestone, limestone-dolomite, sandstone and quartzite, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Withheld to avoid disclosing company proprietary data; included in "Total."
[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

UTAH: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r16	r3,170	r$24,000	r$7.58	13	1,980	$12,300	$6.23
Dolomite	2	W	W	3.65	2	W	W	2.66
Sandstone and quartzite	r5	W	W	r5.07	5	W	W	6.30
Volcanic cinder and scoria	4	13	105	8.07	3	4	4	1.00
Total	XX	4,560	29,400	6.45	XX	4,540	19,800	4.36

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "Limestone-dolomite," reported with no distinction between the two.

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TABLE 4

UTAH: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	—	—	W	W	—	—
Coarse aggregate, graded[3]	—	—	W	W	—	—
Fine aggregate (-3/8 inch)[4]	—	—	W	W	—	—
Coarse and fine aggregate[5]	—	—	W	W	—	—
Other construction materials	—	—	2,260	5,110	—	—
Agricultural[6]	—	—	(7)	(7)	—	—
Chemical and metallurgical[8]	(7)	(7)	(7)	(7)	—	—
Unspecified:[9] Estimated	(7)	(7)	(7)	(7)	17	103
Total	1,510	11,500	3,020	8,230	17	103

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes riprap and jetty stone.
[3]Includes bituminous aggregate (coarse).
[4]Includes stone sand (bituminous mix or seal) and screening (undesignated).
[5]Includes graded road base or subbase, unpaved road surfacing, and crusher run (select material or fill).
[6]Includes poultry grit and mineral food.
[7]Withheld to avoid disclosing company proprietary data; included in "Total."
[8]Includes cement manufacture, flux stone, and lime manufacture.
[9]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

UTAH: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate and concrete products[2]	4,110	$16,500	$4.02
Asphaltic concrete aggregates and other bituminous mixtures	2,230	9,100	4.07
Road base and coverings[3]	5,130	15,600	3.04
Fill	3,830	6,530	1.70
Other[4]	173	709	4.10
Unspecified:[5]			
Actual	54	114	2.11
Estimated	5,570	21,000	3.77
Total or average	21,100	69,600	3.30

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (lime).
[4]Includes railroad ballast and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

UTAH: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

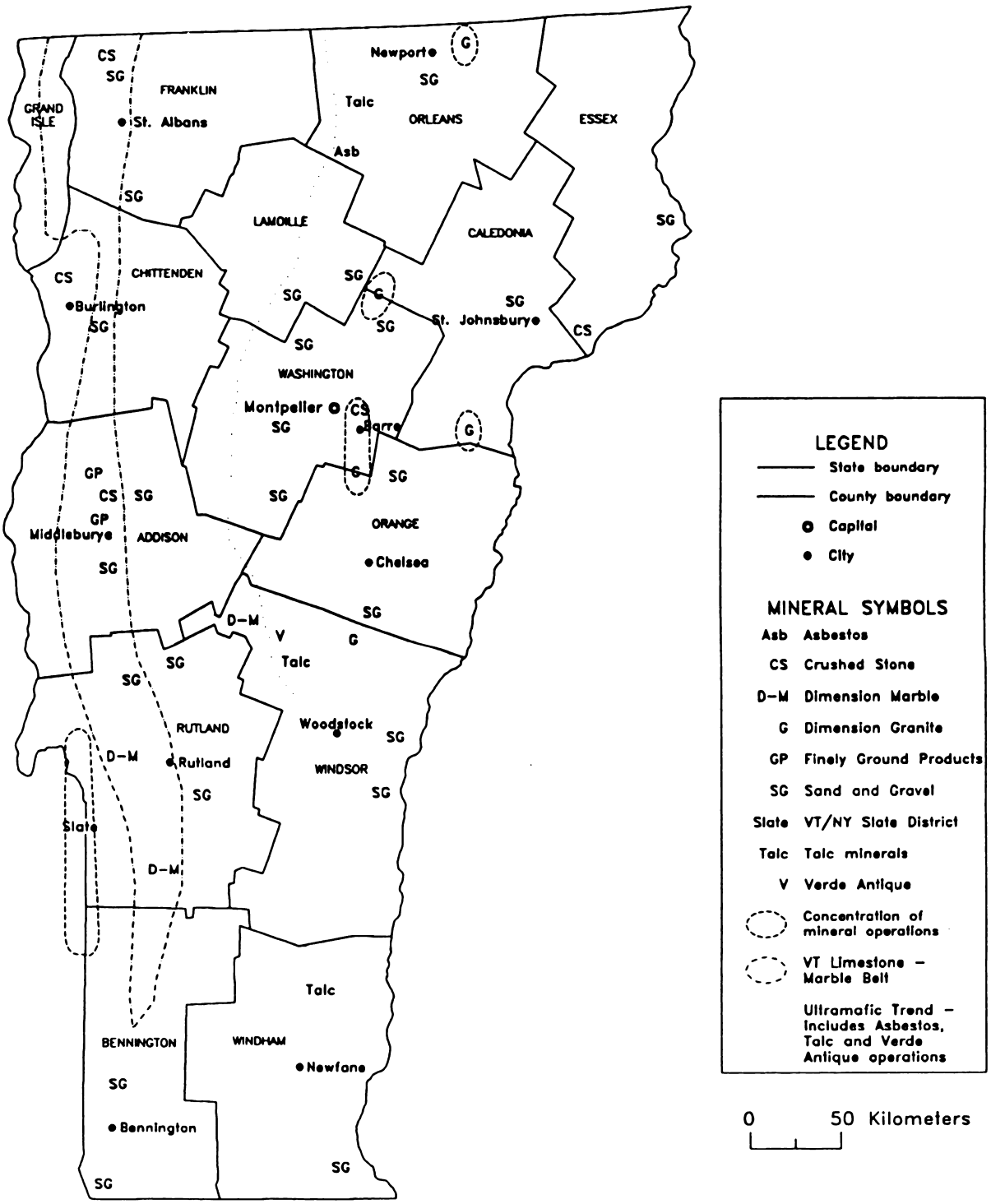
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		Unspecified within all districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	1,490	6,110	2,460	8,970	167	1,440	—	—
Asphaltic concrete aggregates and road base materials	639	2,310	1,270	5,140	94	871	234	786
Road base and covering[3]	1,310	3,850	2,820	8,160	754	2,890	245	674
Fill	604	862	2,960	5,170	272	503	—	—
Other miscellaneous uses[4]	25	45	94	318	55	347	—	—
Unspecified:[5]								
Actual	2	6	41	90	11	18	—	—
Estimated	513	1,800	3,960	14,100	1,090	5,160	—	—
Total	4,580	15,000	13,600	41,900	2,440	11,200	478	1,460

[1]Data rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill, and road and other stabilization (lime).
[4]Includes railroad ballast and snow and ice control.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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VERMONT



LEGEND

- State boundary
- County boundary
- Capital
- City

MINERAL SYMBOLS

Asb	Asbestos
CS	Crushed Stone
D-M	Dimension Marble
G	Dimension Granite
GP	Finely Ground Products
SG	Sand and Gravel
Slate	VT/NY Slate District
Talc	Talc minerals
V	Verde Antique

Concentration of mineral operations

VT Limestone – Marble Belt

Ultramafic Trend – Includes Asbestos, Talc and Verde Antique operations

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF VERMONT

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Agency of Natural Resources, Division of Geology and Mineral Resources, for collecting information on all nonfuel minerals.

In 1995, Vermont ranked 45th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The State was 44th in 1994. The estimated value for 1995 was $68 million, a 7% increase from that of 1994. This followed a 20% increase from 1993 to 1994 (based on final data). The State accounted for somewhat less than 0.5% of the U.S. total nonfuel mineral production value. Compared with 1994, the mineral commodity values that increased in 1995 were crushed stone and dimension stone, while construction sand and gravel and talc and pyrophyllite values decreased.

Compared with USGS estimates of the quantities produced in the 50 States during 1995, Vermont remained third in talc and pyrophyllite and fourth in dimension stone. No asbestos production was reported to the USGS in 1995.

The Vermont Geological Survey[2] reported that the Vermont General Assembly made several changes to the Vermont Land Use and Development Law, ACT 250. Several sections were added to clarify definitions important to the dimension stone industry. The term "slate quarry" was defined as "a quarry pit or hole from which slate has been extracted or removed for the purpose of commercial production of building material, roofing, tile, or other dimensional stone products," and "a slate quarry...inactive since June 1, 1970...shall be deemed to be held in reserve, and shall not be deemed abandoned." Any activities not defined as ancillary to the slate industry may constitute substantial changes from previous legal definitions and be subject to permitting requirements under ACT 250. "Crushing" activities may also constitute substantial changes if they cause significant impact with respect to any of the criteria specified within the subdivisions of the title. The legislation established a registration program for quarries that were held in reserve. Registration closes January 1, 1997.

A "Special Joint Committee on the Granite Industry" was created to examine the condition of the industry in the State. The Committee studied the factors that might impede or promote the industry's development and was to report to the General Assembly in the 1996 session with any recommendations for legislation or State policies to improve the welfare of Vermont's granite industry.

In January 1995, the New England Governor's Conference released the Report on Construction Aggregate Resources of New England; Vermont was one of six States participating in the study. Vermont's "nonexcluded volume" (reserves) was reported to be 12.2 billion cubic meters (16 billion cubic yards). The State's projected demand for aggregate from 1990 to 2010 was estimated to be 40 million cubic meters (52 million cubic yards).

In industry news, the Lawson Granite Co. and the Aderson Friberg Co. were absorbed by the Rock of Ages Corp. on December 31, 1995.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VERMONT[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Asbestos	metric tons	3,660	$1,530	1,130	$920	—	—
Gemstones		NA	1	NA	1	NA	$1
Sand and gravel (construction)	thousand metric tons	e3,000	e10,400	3,890	14,500	2,900	11,000
Stone:							
Crushed	do.	2,520	12,900	4,170	23,700	4,800	27,800
Dimension	metric tons	97,400	27,900	r78,900	r$23,200	102,000	28,900
Total[3]		XX	52,700	XX	r63,300	XX	67,700

eEstimated. pPreliminary. rRevised. NA Not available. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Partial total, excludes values that must be concealed to avoid disclosing company proprietary data.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates, as of Dec. 1995. Construction sand and gravel and crushed stone estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Vermont Geological Survey.

TABLE 2

VERMONT: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	17	$114	$6.71
Riprap and jetty stone	65	301	4.63
Filter stone	W	W	5.85
Coarse aggregate, graded:			
Concrete aggregate, coarse	143	828	5.79
Bituminous aggregate, coarse	W	W	5.68
Bituminous surface-treatment aggregate	48	286	5.96
Railroad ballast	W	W	5.59
Coarse and fine aggregates:			
Graded road base or subbase	326	1,680	5.14
Unpaved road surfacing	164	1,190	7.27
Crusher run or fill or waste	11	48	4.36
Other construction materials[3]	500	2,980	5.95
Unspecified:[4]			
Actual	944	4,330	4.59
Estimated	1,950	11,900	6.12
Total	4,170	23,700	5.68

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes dolomite, granite, limestone, marble, quartzite, and slate.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes pipe bedding, stone sand (bituminous mix or seal), and other specified uses not listed.

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

VERMONT: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	r5	r1,030	r$6,050	$5.90	6	1,800	$11,200	$6.20
Dolomite	1	W	W	5.71	4	234	1,220	5.22
Marble	2	W	W	6.38	5	839	4,730	5.63
Granite	6	495	1,510	3.04	5	508	2,040	4.02
Quartzite	r2	W	W	r4.59	2	W	W	5.37
Slate	1	W	W	8.94	1	W	W	9.45
Total	XX	2,520	12,900	5.12	XX	4,170	23,700	5.68

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.

TABLE 4

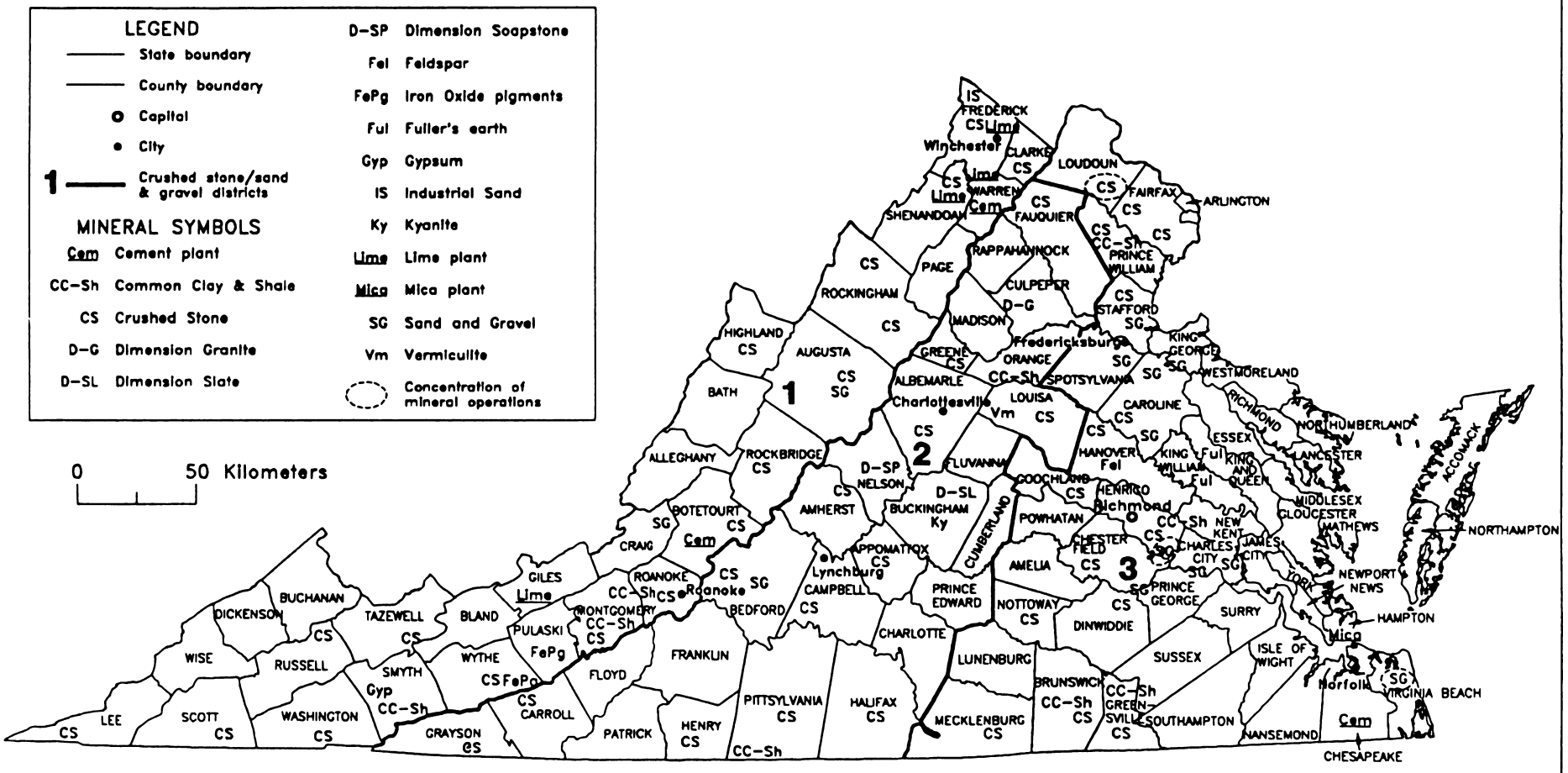
VERMONT: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate[2]	588	$2,710	$4.61
Concrete products (blocks, bricks, pipe, decorative, etc.)	18	93	5.17
Asphaltic concrete aggregates and other bituminous mixtures	124	464	3.74
Road base and coverings[3]	1,260	4,130	3.29
Fill	274	544	1.99
Snow and ice control	288	915	3.18
Filtration	44	277	6.30
Other[4]	45	213	4.73
Unspecified:[5]			
Actual	429	2,080	4.85
Estimated	821	3,060	3.72
Total or average	3,890	14,500	3.72

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes road and other stabilization (cement).
[4]Includes railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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VIRGINIA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF VIRGINIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Virginia Division of Mineral Resources for collecting information on all nonfuel minerals.

Virginia ranked 24th among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was almost $517 million, a 3% increase from that of 1994. This followed an 8% increase in 1994 from 1993 (based on final data). In 1995, the State accounted for about 1.5% of the U.S. total nonfuel mineral production value.

Virginia mines almost exclusively produce industrial minerals and coal. The last significant metal production occurred in 1981 when the State's only consistently active metal mine, an underground zinc operation, closed down due to the recession and a depressed market. Although a diverse variety of minerals were produced in Virginia, crushed stone accounted for 66% of the State's nonfuel mineral value. During the past 6 years, 1990-95, the State has produced more than 300 million metric tons of crushed stone or an average of 50 million metric tons per year. Compared with 1994, the value of the following nonfuel minerals and mineral products increased: crushed stone, lime, construction sand and gravel, kyanite, masonry cement, dimension stone, feldspar, talc, and gemstones. The values of portland cement, fuller's earth clays, gypsum, common clays, and vermiculite decreased.

Based on USGS estimates of quantities produced in the 50 States during 1995, Virginia remained second in the production of feldspar, second of two States that produce vermiculite, fourth in iron oxide pigments, seventh in talc, eighth in fuller's earth, and ninth in lime. The State dropped in rank from sixth to seventh in the production of crushed stone. While the only producing kyanite mine in the United States was in Virginia, mullite, a calcined kyanite, was synthetically produced in three other States. Ninety percent of U.S. kyanite and mullite output is used in refractories for the smelting and processing of a variety of metals and in glass and high-temperature ceramics manufacturing. Additionally, Virginia mines and manufacturing plants produced significant quantities of construction and industrial sand and gravel, crude gypsum, common clays, and portland and masonry cements.

In 1995, according to the Virginia Division of

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN VIRGINIA[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Cement (portland)	metric tons	W	W	930,000	$54,700	827,000	$48,600
Clays[3]	thousand metric tons	775	$2,950	870	3,250	861	3,210
Lime	do.	756	40,000	742	40,200	834	44,200
Sand and gravel (construction)	do.	e9,000	e40,500	8,060	33,400	8,200	34,800
Stone:							
Crushed	do.	51,000	292,000	56,700	327,000	58,500	342,000
Dimension	metric tons	W	W	e108	e13	W	W
Combine value of cement (masonry), clays [bentonite (1993), fuller's earth], feldspar, gemstones, gypsum (crude), iron oxide pigments (crude), kyanite, sand and gravel (industrial), stone [dimension (1993, 1995), dimension granite and slate (1994)], talc, vermiculite, and values indicated by symbol W		XX	88,900	XX	43,600	XX	44,100
Total		XX	465,000	XX	502,000	XX	517,000

eEstimated. pPreliminary. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Excludes certain stones; kind and value included with "Combined value" data.

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Mineral Resources (VDMR),[2] several companies conducted reconnaissance geologic, geochemical, and geophysical investigations for base and precious metals in the Piedmont geologic province of Virginia, especially in Campbell and Goochland Counties. JLJ Enterprises trucked several loads of ore to their plant north of Clarksville in Mecklenburg County. Evaluation of techniques for processing the ore continued. Gold Crown Mining Co. continued to intermittently mine small amounts of gold from the old Kentuck Mine, east of Danville, in Pittsylvania County.

In February, Dalrymple Realty Corp. of New York acquired the quarries of A.H. Smith Co. in Culpeper (diabase rock) and Louisa Counties (granite) and began operation of them in the summer.

On March 31, Tulikivi, Inc., a Finish company, discontinued producing soapstone stoves at their New Alberene Stone Co., Inc. plant in Schuyler, Nelson County. Although more efficient than the standard cast iron wood-burning stove, stoves produced from soapstone were not economically competitive. A sales office in Charlottesville continued taking domestic orders for stoves that are produced in Finland. The plant remained open, producing architectural stone by special order.

Interest in heavy minerals continued along the western edge of the Coastal Plain geologic province in southern Virginia. In Dinwiddie, Greensville, and Sussex Counties, more than 7 million metric tons (8 million short tons) of heavy mineral sands have been discovered and large acreages remain under lease by RGC (USA) Mineral Sands, Inc. Ilmenite, leucoxene, rutile, and zircon comprise nearly 80% of the known heavy mineral concentrate. RGC is mining a 1-acre site (pilot operation) to evaluate the ore from the Old Hickory deposit, near Bolsters Store, in Dinwiddie and Sussex Counties. In September and October, the Board of Supervisors in both counties approved conditional-use permits for RGC to mine titanium ores. Sussex County's Planning Commission has already approved zoning permits in that county. RGC is planning to invest about $20 million in the dry-mining venture.

The VDMR continued geologic mapping in several counties at a detailed 1:24,000 scale and continued to compile and digitize 1:100,000 scale maps. The agency also continued several projects including 1:24,000 scale maps of the State's mineral resources, the Statewide carbonate rock identification project, and the epithermal hot springs study and oil and gas studies of Dickerson and Russell Counties. VDMR publications for the year included studies on coalbed methane in Virginia; cadmium, gallium, and germanium resources; a precious metals study; reports about coal beds, coal zones, and stratigraphic names of Pennsylvanian (geologic age) units of southwestern Virginia; a geologic map of Warren County; a 1990-94 bibliography and index of Virginia geology; a brochure on coal in Virginia; and a report on the statistics and compilation of coal, oil and gas, and industrial and metallic mineral resources produced in Virginia in 1993.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]The remaining narrative portion of this report was based on information provided by the VDMR.

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TABLE 2

VIRGINIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	$4.41
Riprap and jetty stone	808	$5,480	6.78
Filter stone	585	3,370	5.76
Other coarse aggregate	347	2,040	5.88
Coarse aggregate, graded:			
Concrete aggregate, coarse	5,160	31,800	6.18
Bituminous aggregate, coarse	3,040	19,500	6.40
Bituminous surface-treatment aggregate	917	6,070	6.62
Railroad ballast	407	2,490	6.11
Other graded coarse aggregate	641	4,150	6.47
Fine aggregate (-3/8 inch):			
Stone sand, concrete	784	5,300	6.76
Stone sand, bituminous mix or seal	481	3,110	6.46
Screening, undesignated	2,610	13,800	5.29
Other fine aggregate	270	1,680	6.22
Coarse and fine aggregates:			
Graded road base or subbase	7,690	39,400	5.12
Unpaved road surfacing	639	3,750	5.87
Terrazzo and exposed aggregate	30	89	2.97
Crusher run or fill or waste	3,150	14,100	4.46
Other coarse and fine aggregates	434	1,700	3.92
Other construction materials[3]	2,720	18,200	6.67
Agricultural:			
Agricultural limestone	790	10,600	13.40
Poultry grit and mineral food	137	1,460	10.70
Other agricultural uses	(4)	(4)	11.00
Chemical and metallurgical:			
Cement manufacture	1,480	4,920	3.33
Lime manufacture	1,550	6,350	4.10
Flux stone	(4)	(4)	9.71
Chemical stone	(4)	(4)	7.84
Glass manufacture	304	3,200	10.50
Sulfur oxide removal	(4)	(4)	6.15
Special:			
Mine dusting or acid water treatment	(4)	(4)	25.30
Asphalt fillers or extenders	(4)	(4)	6.40
Whiting or whiting substitute	(4)	(4)	33.50
Other fillers or extenders	17	257	15.10
Abrasives	(4)	(4)	6.13
Other specified uses not listed	568	6,440	11.30
Unspecified:[5]			
Actual	20,500	114,000	5.55
Estimated	694	4,450	6.41
Total	56,700	327,000	5.77

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, granite, limestone, miscellaneous stone, sandstone and quartzite, slate, and traprock.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes drain fields.
[4]Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	[2]43	r [2]14,700	r [2]$85,600	r [2]$5.82	42	16,300	$89,800	$5.51
Dolomite	11	3,430	27,100	r7.90	10	3,650	27,800	7.61
Granite	33	20,700	116,000	5.58	31	22,200	127,000	5.75
Traprock	10	10,600	55,500	r5.26	10	12,700	71,800	5.64
Sandstone and quartzite	7	1,220	6,630	5.44	7	1,330	7,460	5.60
Slate	1	W	W	r2.66	1	W	W	2.80
Miscellaneous stone	1	W	W	r5.82	2	W	W	6.08
Total	XX	51,000	292,000	5.73	XX	56,700	327,000	5.77

rRevised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.
[1]Previously published and 1994 data are rounded to three significant digits; may not add to totals shown.
[2]Includes "limestone-dolomite," reported with no distinction between the two.

TABLE 4
VIRGINIA: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[2]	917	4,790	241	1,640	794	5,400
Coarse aggregate, graded[3]	2,780	15,700	1,990	13,200	5,400	35,100
Fine aggregate (-3/8 inch)[4]	1,080	6,990	535	3,190	2,530	13,700
Coarse and fine aggregate[5]	3,680	17,500	2,080	10,300	6,190	31,100
Other construction materials[6]	(7)	(7)	242	1,190	(7)	(7)
Agricultural[8]	(7)	(7)	(7)	(7)	—	—
Chemical and metallurgical[9]	3,440	15,200	—	—	—	—
Special[10]	(7)	(7)	(7)	(7)	—	—
Other miscellaneous uses[11]	(7)	(7)	—	—	—	—
Unspecified:[12]						
Actual	3,880	21,700	(7)	(7)	(7)	(7)
Estimated	299	2,150	395	2,300	—	—
Total	18,000	104,000	9,660	57,900	29,100	165,000

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.
[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[4]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[6]Includes drain fields.
[7]Withheld to avoid disclosing company proprietary data; included in "Total."
[8]Includes agricultural limestone, poultry grit and mineral food, and other agricultural uses.
[9]Includes cement manufacture, chemical stone for alkali works, flux stone, glass manufacture, lime manufacture, and sulfur oxide removal.
[10]Includes asphalt fillers or extenders, mine dusting or acid water treatment, other fillers or extenders, and whiting or whiting substitute.
[11]Includes other specified uses not listed.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	2,810	$14,800	$5.28
Plaster and gunite sands	11	70	6.36
Concrete products (blocks, brick, pipe, decorative, etc.)	227	1,330	5.85
Asphaltic concrete aggregates and other bituminous mixtures	875	3,640	4.16
Road base and coverings	895	2,650	2.96
Fill	1,290	2,880	2.23
Snow and ice control	140	545	3.89
Other[2]	119	547	4.60
Unspecified:[3]			
Actual	1,490	6,050	4.06
Estimated	195	857	4.39
Total or average	8,060	33,400	4.15

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filtration.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

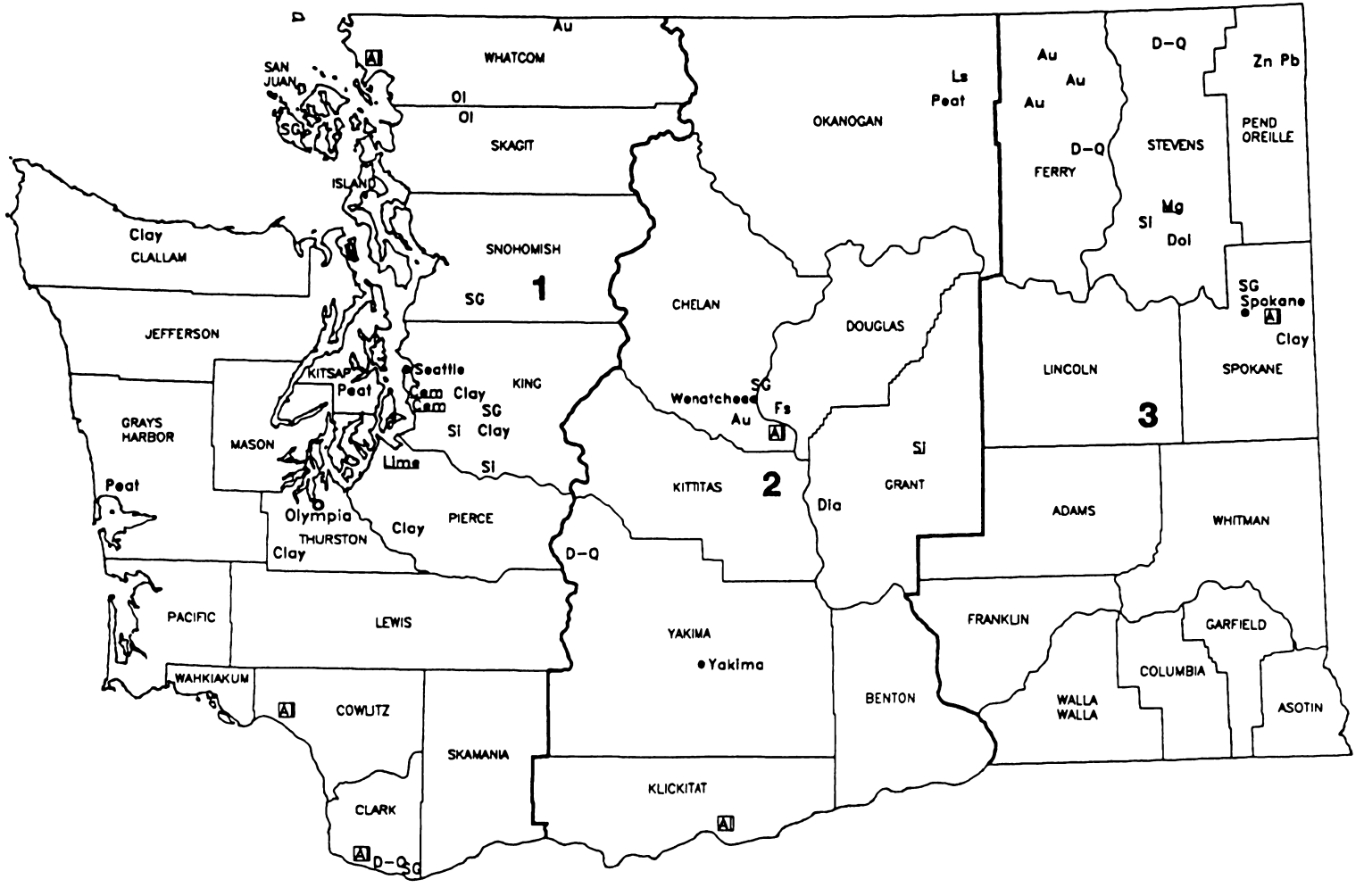
(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	408	2,800	W	17	2,400	12,000
Plaster and gunite sands	—	—	—	—	11	70
Concrete (blocks, brick, etc.)	—	—	W	(2)	227	1,330
Asphaltic concrete aggregates and road base materials[3]	W	W	W	W	2,590	6,980
Snow and ice control	W	W	W	W	89	306
Other miscellaneous uses[4]	—	—	—	—	119	547
Unspecified:[5]						
Actual	42	231	12	77	1,440	5,740
Estimated	—	—	19	53	176	803
Total	755	4,550	250	1,060	7,050	27,800

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Less than 1/2 unit.
[3]Includes fill.
[4]Includes filtration.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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WASHINGTON



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

A	Aluminum plant
Au	Gold
Cem	Cement plant
Clay	Clay
CS	Crushed Stone
D-Q	Dimension Quartzite
Dia	diatomite
Dol	Dolomite
Fs	Ferrosilic
Gyp	Gypsum
Lime	Lime plant
Ls	Limestone
Mg	Magnesium metal plant
Ol	Olivine
Pb	Lead
Peat	Peat
Si	Silica
Sl	Silica plant
SG	Sand and Gravel
Zn	Zinc

0 50 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF WASHINGTON

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Washington Division of Geology and Earth Resources for collecting information on all nonfuel minerals.

In 1995, for the 3d consecutive year, the State of Washington ranked 20th in the Nation in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $613 million, a 7% increase from that of 1994. This followed a 12.8% increase from 1993 to 1994 (based on final 1994 data). The State accounted for more than 1.5% of the U.S. total nonfuel mineral production value.

Washington's increased mineral value in 1995 resulted mainly from estimated 35% and 25% increases, respectively, for crushed stone and magnesium metal. Overall, the increase in mineral value was lessened somewhat by decreases in portland cement, gold, and construction sand and gravel. While metals, especially gold and magnesium metal, represented around one-third of the State's nonfuel mineral value, construction sand and gravel, portland cement, crushed stone, and lime accounted for about 60%. Other commodity values that increased in 1995 were diatomite and silver. Decreases occurred in lime, industrial sand and gravel, olivine, common clays, gemstones, and masonry cement.

Based on USGS estimates of the quantities produced in the 50 States in 1995, Washington climbed from fourth to third in diatomite production and from sixth to fifth in fire clays. The State remained 2d of the 3 States that produce magnesium metal, 5th in construction sand and gravel, 6th among the 14 gold-producing States, and 10th in silver. Approximately the same quantity of olivine was mined and processed in Washington as in North Carolina, the only other State that produced the mineral. Although not among the top 10 producing States, Washington mines and manufacturing plants, nonetheless, produced significant quantities of crushed stone, common clays, lime, and portland cement. Washington continued to lead the Nation in the production of primary aluminum with an estimated 986,000 metric tons,[2] a 2% increase from that of 1994. The State accounted for nearly 30% of

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WASHINGTON[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	238	$1,370	246	$1,140	242	$1,070
Gemstones		NA	24	NA	1,050	NA	208
Gold[4]	kilograms	7,110	82,500	[5]7,410	[5]91,800	[5]7,270	[5]87,300
Lime	thousand metric tons	213	W	239	W	W	W
Peat	metric tons	W	W	3,000	111	W	W
Sand and gravel (construction)	thousand metric tons	[e]40,200	[e]158,000	39,600	165,000	38,000	162,000
Silver[4]	metric tons	14	1,940	W	W	W	W
Stone (crushed)	thousand metric tons	13,200	68,600	15,500	86,100	20,600	118,000
Combined value of cement, clays (fire), diatomite, lead (1993), magnesium metal, olivine, sand and gravel (industrial), stone [dimension (1993, 1995), dimension miscellaneous (1994)], zinc (1993), and values indicated by symbol W		XX	193,000	XX	[r]225,000	XX	244,000
Total		XX	505,000	XX	[r]570,000	XX	613,000

[e]Estimated. [p]Preliminary. [r]Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Excludes certain clays; kind and value included with "Combined value" data.

[4]Recoverable content of ores, etc.

[5]Placer canvassing discontinued beginning 1994.

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the country's total primary aluminum production. Raw steel also was produced in the State, both metals being processed from materials received from other foreign and domestic sources.

According to the Washington State Division of Geology and Earth Resources, the State's gold mining industry was fairly active during 1995. The only major gold mine in operation for all of 1995 was owned by Echo Bay Minerals Co. Most of Echo Bay's ore came from the Lamefoot deposit, the rest from the completion of mining of the Overlook deposit. The company continued exploratory work on its K-2 deposit.

Hecla Mining Co.'s gold and silver operation, the Republic unit, closed in January 1995 after reserves were depleted from the Golden Promise deposit. The closure came less than a month after Asamera Minerals Inc.'s Cannon Mine at Wenatchee shut down in December 1994. The two mines together produced more than 4,660 kilograms (150,000 troy ounces) of gold in 1994. Hecla also announced the signing of an earn-in agreement with Santa Fe Pacific Gold Corp. to explore and develop the Golden Eagle deposit at Republic. The Golden Eagle reportedly has an identified mineral inventory of 10.3 million tons (11.3 million short tons) of material with an average grade of 3.43 grams per ton (0.1 troy ounce per ton) of gold. Asamera Minerals sold its mill at the Cannon Mine; the mill and all other buildings except the mine office were removed from the mine site. The company was negotiating to sell the office building to the Wenatchee School District.

Battle Mountain Gold Co. completed and submitted in July a draft environmental impact statement (EIS) for its Crown Jewel deposit. More than 3,400 comments were received for the draft EIS. Following revisions, a final EIS will be released and the process for obtaining permits to mine will begin.

Resource Finance Corp. continued underground exploration at the Pend Oreille Mine, a zinc, lead, silver, and cadmium deposit in the northeast corner of the State. The company was waiting for more favorable zinc prices before reopening the mine.

The major change in the industrial minerals sector in 1995 involved Nanome Aggregates, Inc., which discontinued its Washington operations. The company was best known for production of a wide variety of naturally colored terrazzo floor chips from quarries near Valley in Stevens County.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most recent information please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]All tons are metric unless otherwise specified.

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TABLE 2

WASHINGTON: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	$6.82
Riprap and jetty stone	360	$2,730	7.57
Filter stone	100	462	4.62
Other coarse aggregate	W	W	7.38
Coarse aggregate, graded:			
Concrete aggregate, coarse	W	W	3.87
Bituminous aggregate, coarse	302	1,020	3.36
Bituminous surface-treatment aggregate	30	129	4.30
Railroad ballast	99	562	5.68
Other graded coarse aggregate	W	W	4.78
Coarse and fine aggregates:			
Graded road base or subbase	717	2,580	3.60
Unpaved road surfacing	1,090	2,630	2.40
Terrazzo and exposed aggregate	163	1,650	10.10
Crusher run or fill or waste	364	2,030	5.57
Other coarse and fine aggregates	W	W	13.20
Other construction materials[3]	932	8,900	9.55
Agricultural:			
Agricultural limestone	(4)	(4)	27.50
Poultry grit and mineral food	(4)	(4)	32.20
Chemical and metallurgical:			
Lime manufacture	(4)	(4)	16.50
Flux stone	37	515	13.90
Special:			
Mine dusting or acid water treatment	(4)	(4)	13.70
Asphalt fillers or extenders	9	23	2.56
Other fillers or extenders	(4)	(4)	104.00
Unspecified:[5]			
Actual	4,360	22,800	5.24
Estimated	6,860	31,000	4.52
Total	15,500	86,100	5.54

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Includes dolomite, granite, limestone, limestone-dolomite, marble, miscellaneous stone, sandstone, traprock, and volcanic cinder and scoria.

[2]Data are rounded to three significant digits; may not add to totals shown.

[3]Includes stone sand (bituminous mix or seal), and screening (undesignated).

[4]Withheld to avoid disclosing company proprietary data; included with "Total."

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3

WASHINGTON: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r7	W	W	W	10	2,140	$23,600	$11.00
Dolomite	r4	r318	r$1,370	r$4.31	4	281	1,120	3.99
Marble	—	—	—	—	2	W	W	5.46
Granite	r12	r640	r3,450	r5.39	11	234	1,030	4.38
Traprock	r118	r9,800	r45,400	4.63	117	10,700	47,900	4.48
Sandstone	r3	W	W	r4.16	4	W	W	3.99
Volcanic cinder and scoria	3	W	W	W	3	W	W	9.02
Miscellaneous stone	r6	r437	r2,120	r4.85	8	475	2,560	5.40
Total	XX	13,200	68,600	5.20	XX	15,500	86,100	5.54

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.

[1]Data are rounded to three significant digits.

[2]Includes "Limestone-dolomite," reported with no distinction between the two.

TABLE 4

WASHINGTON: CRUSHED STONE SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3		Unspecified within all districts	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:								
Coarse aggregate (+1 1/2 inch)[2]	625	4,470	10	W	7	W	—	—
Coarse aggregate, graded[3]	W	W	W	W	W	W	—	—
Fine aggregate (-3/8 inch)[4]	W	W	—	—	—	—	—	—
Coarse and fine aggregate[5]	2,150	12,100	W	W	W	W	—	—
Other construction materials	352	1,950	241	1,610	775	2,540	—	—
Agricultural[6]	—	—	(7)	(7)	(7)	(7)	—	—
Chemical and metallurgical[8]	—	—	—	—	(7)	(7)	—	—
Special[9]	—	—	(7)	(7)	(7)	(7)	—	—
Unspecified:[10]								
Actual	3,280	18,900	435	1,650	435	1,040	209	1,230
Estimated	4,080	18,600	208	833	2,580	11,600	—	—
Total	10,500	56,100	987	13,000	3,850	15,800	209	1,230

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[3]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[4]Includes stone sand (concrete), and screening (undesignated).

[5]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.

[6]Includes agricultural limestone and poultry grit and mineral food.

[7]Withheld to avoid disclosing company proprietary data; included in "Total."

[8]Includes flux stone and lime manufacture.

[9]Includes asphalt fillers or extenders, mine dusting or acid water treatment, and other fillers or extenders.

[10]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

WASHINGTON: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	10,900	$52,000	$4.77
Plaster and gunite sands	241	883	3.66
Concrete products (blocks, bricks, pipe, decorative, etc.)	402	5,450	13.60
Asphaltic concrete aggregates and other bituminous mixtures	1,840	9,000	4.89
Road base and coverings	6,240	27,800	4.46
Fill	7,770	20,200	2.59
Snow and ice control	218	847	3.89
Other[2]	367	1,740	4.73
Unspecified:[3]			
Actual	3,190	10,300	3.21
Estimated	8,400	36,400	4.34
Total or average	39,600	165,000	4.16

[1]Data rounded to three significant digits; may not add to totals shown.
[2]Includes filtration and railroad ballast.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 6

WASHINGTON: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

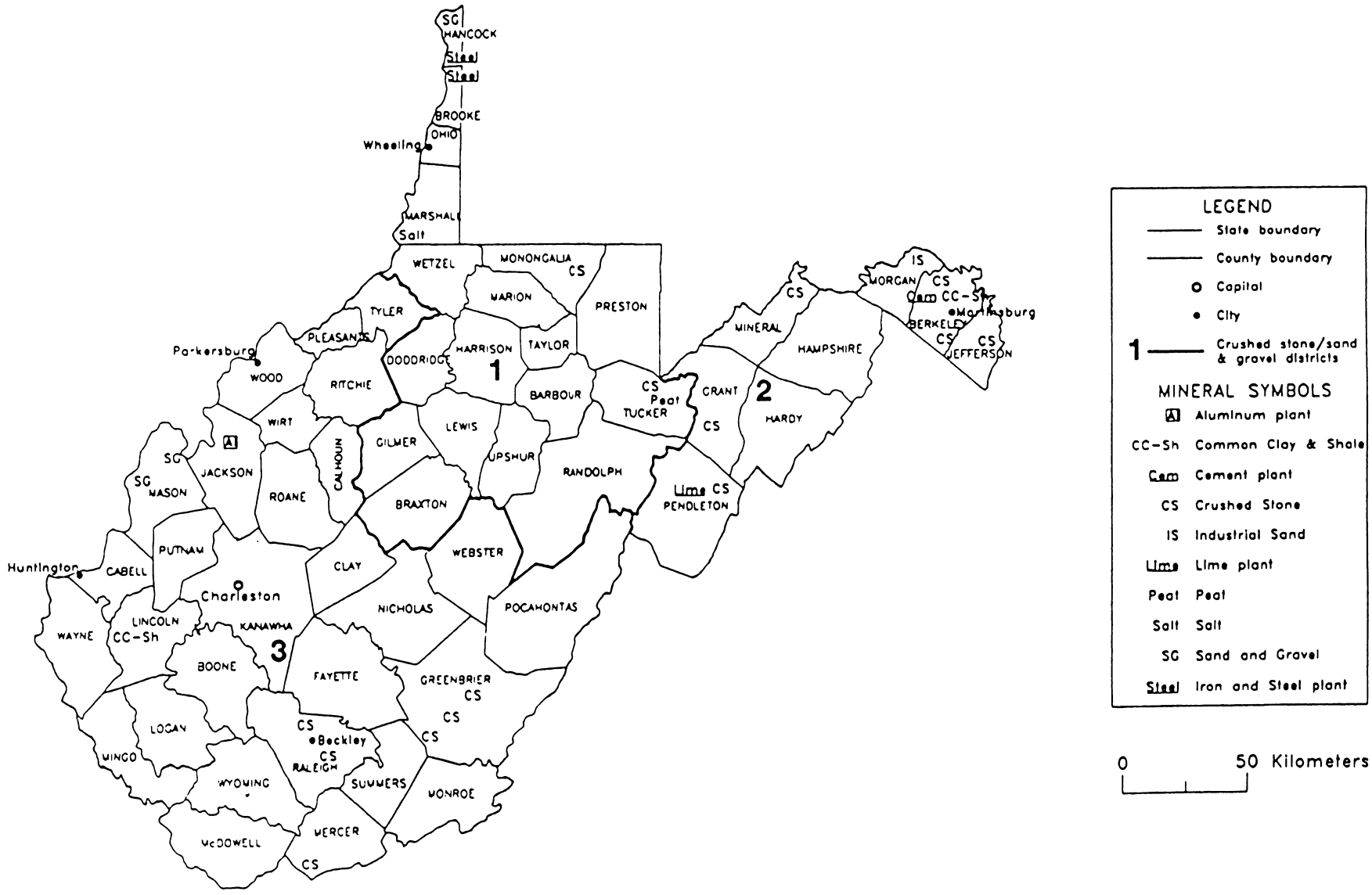
Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	7,870	45,800	1,150	3,990
Asphaltic concrete aggregates and road base materials[3]	13,600	47,900	1,410	5,430
Snow and ice control	82	454	32	129
Other miscellaneous uses[4]	302	1,510	43	71
Unspecified:[5]				
Actual	1,360	4,400	725	2,640
Estimated	5,260	23,500	2,640	10,200
Total	28,400	124,000	5,990	22,500

	District 3		Unspecified within all districts	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	2,530	8,510	—	—
Asphaltic concrete aggregates and road base materials[3]	880	3,710	—	—
Snow and ice control	104	264	—	—
Other miscellaneous uses[4]	23	160	—	—
Unspecified:[5]				
Actual	1,110	3,220	—	—
Estimated	443	2,480	66	241
Total	5,080	18,300	66	241

[1]Data rounded to three significant digits; may not add to totals shown.
[2]Includes plaster and gunite sands.
[3]Includes fill.
[4]Includes filtration and railroad ballast.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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WEST VIRGINIA



Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF WEST VIRGINIA

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the West Virginia Geological and Economic Survey for collecting information on all nonfuel minerals.

West Virginia ranked 40th among the 50 States in total nonfuel mineral production value[2] in 1995, according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $194 million, a 20% increase from that of 1994, following a 10.8% increase in 1994 (based on final data). The State accounted for about 0.5% of the U.S. total nonfuel mineral production value. The increased values of the past 2 years mostly resulted from increases in crushed stone and portland cement, the State's leading nonfuel mineral commodities. In 1995, other commodities with increased values were salt, lime, and common clays; decreases occurred in construction sand and gravel and masonry cement.

Based on USGS estimates of quantities produced in the 50 States in 1995, West Virginia was 10th in salt. Additionally, the State's mines and manufacturing plants produced significant quantities of crushed stone, construction and industrial sand and gravel, and portland cement. West Virginia mines produced only industrial minerals and coal; no metals were mined in the State. Primary aluminum and raw steel were produced, but both metals were processed from materials acquired from other domestic and foreign sources. West Virginia remained eighth in the Nation in primary aluminum production in 1995.

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[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WEST VIRGINIA[1 2]

Mineral		1993 Quantity	1993 Value (thousands)	1994 Quantity	1994 Value (thousands)	1995[p] Quantity	1995[p] Value (thousands)
Clays	thousand metric tons	115	$334	138	$291	152	$335
Gemstones		NA	1	NA	1	NA	1
Sand and gravel (construction)	thousand metric tons	[e]1,400	[e]6,700	1,380	5,970	1,300	5,700
Stone (crushed)	do.	[3]10,300	79,700	[3]12,300	99,300	[3]13,100	107,000
Combined value of cement, lime, peat, salt, sand and gravel (industrial), and stone [crushed dolomite, dimension (1994)]		XX	62,800	XX	75,500	XX	80,100
Total		XX	149,000	XX	181,000	XX	194,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain stones; kind and value included with "Combined value" data.

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TABLE 2
WEST VIRGINIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	222	$1,220	$5.50
Filter stone	224	1,260	5.63
Other coarse aggregate	175	1,260	7.20
Coarse aggregate, graded:			
Concrete aggregate, coarse	611	3,340	5.47
Bituminous aggregate, coarse	416	2,180	5.24
Bituminous surface-treatment aggregate	298	1,650	5.54
Railroad ballast	34	1,400	41.20
Other graded coarse aggregate	187	8,170	43.70
Fine aggregate (-3/8 inch):			
Stone sand, concrete	88	571	6.49
Stone sand, bituminous mix or seal	454	2,480	5.46
Screening, undesignated	277	1,820	6.57
Other fine aggregate	50	1,950	39.00
Coarse and fine aggregates:			
Graded road base or subbase	621	3,320	5.35
Unpaved road surfacing	105	663	6.31
Crusher run or fill or waste	1,180	6,520	5.53
Other coarse and fine aggregates	684	13,600	19.90
Other construction materials	36	250	6.94
Agricultural:			
Agricultural limestone	W	W	9.91
Poultry grit and mineral food	W	W	11.00
Chemical and metallurgical:			
Cement manufacture	W	W	5.77
Lime manufacture	W	W	9.92
Mine dusting or acid water treatment	W	W	17.60
Special: Other specified uses not listed	1,970	13,100	6.65
Unspecified:[3]			
Actual	4,210	31,600	7.51
Estimated	420	2,820	6.71
Total	12,300	99,300	8.07

W Withheld to avoid disclosing company proprietary data; included with "Other specified uses not listed."
[1]Includes dolomite, limestone, and sandstone; excludes dolomite quantity from State total to avoid disclosing proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3
WEST VIRGINIA: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone	29	9,350	$57,600	$6.15	28	10,200	$66,000	$6.48
Dolomite	1	(2)	16,700	(2)	1	(2)	19,200	(2)
Sandstone	11	960	5,350	5.57	13	2,070	14,100	6.79
Total	XX	10,300	79,700	7.72	XX	12,300	99,300	8.07

XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Excludes dolomite quantity only.

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TABLE 4

WEST VIRGINIA: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[2]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[3]	190	1,120	122	874	308	1,750
Coarse aggregate, graded[4]	386	2,170	367	10,300	793	4,260
Fine aggregate (-3/8 inch)[5]	70	465	266	3,330	532	3,020
Coarse and fine aggregate[6]	399	2,240	728	13,800	1,460	8,060
Other construction materials	—	—	18	105	18	145
Agricultural[7]	(8)	(8)	(8)	(8)	—	—
Chemical and metallurgical[9]	(8)	(8)	(8)	(8)	—	—
Special[10]	—	—	(8)	(8)	—	—
Other miscellaneous uses[11]	—	—	—	—	(8)	(8)
Unspecified:[12]						
Actual	3,960	30,400	(8)	(8)	(8)	(8)
Estimated	153	1,240	62	373	206	1,210
Total	5,680	43,300	3,020	36,400	3,570	19,600

[1]Excludes dolomite quantity from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes filter stone, riprap and jetty stone, and other coarse aggregate.
[4]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.
[5]Includes stone sand (concrete), stone sand (bituminous mix or seal), screening (undesignated), and other fine aggregate.
[6]Includes graded road base or subbase, unpaved road surfacing, crusher run (select material or fill), and other coarse and fine aggregates.
[7]Includes agricultural limestone and poultry grit and mineral food.
[8]Withheld to avoid disclosing company proprietary data; included in "Total."
[9]Includes cement manufacture and lime manufacture.
[10]Includes mine dusting or acid water treatment.
[11]Includes other specified uses not listed.
[12]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 5

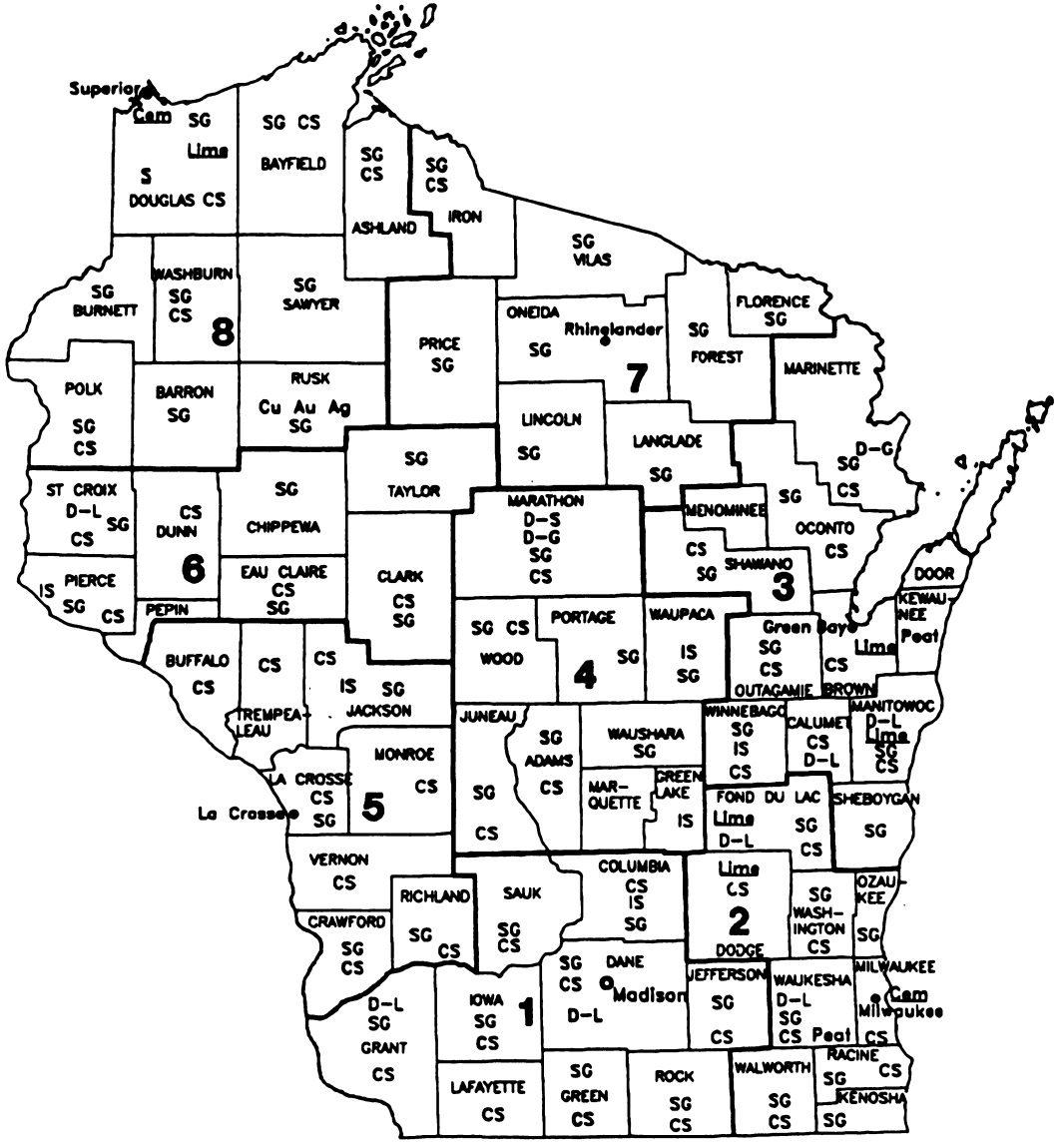
WEST VIRGINIA: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	826	$3,590	$4.35
Concrete products (blocks, brick, pipe, decorative, etc.)	177	719	4.06
Asphaltic concrete aggregates and other bituminous mixtures	92	251	2.73
Fill	156	418	2.68
Snow and ice control	W	W	3.00
Unspecified:[2] Actual	W	W	7.85
Total or average	1,380	5,970	4.33

W Withheld to avoid disclosing company proprietary data; included in "Total."
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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WISCONSIN



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

MINERAL SYMBOLS

Ag	Silver
Au	Gold
Cu	Copper
Cem	Cement plant
CS	Crushed Stone
D–G	Dimension Granite
D–L	Dimension Limestone
D–S	Dimension Sandstone
IS	Industrial Sand
Lime	Lime plant
Peat	Peat
SG	Sand and Gravel
S	Sulfur (Recovered)

0 50 Kilometers

Principal Mineral–Producing Localities

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THE MINERAL INDUSTRY OF WISCONSIN

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Wisconsin Geological and Natural History Survey for collecting information on all nonfuel minerals.

Wisconsin ranked 29th among the 50 States in total nonfuel mineral production value[1] in 1995, according to the U.S. Geological Survey (USGS). The State was 30th in 1994. The estimated value for 1995 was $441 million, an 8% increase compared with that of 1994. This followed a 30% increase from 1993 to 1994 (based on final 1994 data). The State accounted for more than 1% of the U.S. total nonfuel mineral production value.

In 1995, nearly one-third of Wisconsin's nonfuel mineral value was attributed to metal production; higher metal values were the major cause for the State's increased mineral value. A substantial gain in construction sand and gravel value also contributed to the State's overall increase. In 1994, the increase in metal value was significantly greater, reflecting the first full year of production at the Flambeau Mine, than the (also substantial) increase that took place in 1995. Increases in crushed stone and construction sand and gravel values also significantly contributed to the State's overall increase in 1994. Other mineral commodity values that increased in 1995 included: copper, lime, dimension stone, silver, peat, gemstones, and crushed quartzite.

Wisconsin's nonfuel mineral value has increased steadily for the past 3 years, since the resumption of metal mining. Every year from the early 1800's through 1982, metallic mineral production had been reported in the State. In the spring of 1982, metal mining ceased in Wisconsin when the Black River Falls Mine, an open pit taconite (iron ore) mine, closed because of decreased demand for steel. Following a decade of low to moderate metals exploration activities in the State, the Flambeau Mine came on-line in 1993, shipping its first copper, gold, and silver ore to a refinery in Canada in May.

Compared to USGS estimates of quantities produced in the other 49 States for 1995, Wisconsin moved up from sixth to fifth place in the production of copper, while it remained third in dimension stone,

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WISCONSIN[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Gemstones		NA	$45	NA	$53	NA	$65
Lime	thousand metric tons	511	30,900	507	30,300	543	32,800
Peat	metric tons	W	W	2,000	61	W	W
Sand and gravel:							
Construction	do.	e27,600	e82,800	29,200	91,500	31,000	101,000
Industrial	metric tons	1,480,000	31,400	1,630,000	32,400	1,630,000	32,400
Silica stone[3]	do.	W	W	45	80	45	80
Stone:							
Crushed	thousand metric tons	26,200	98,000	28,500	r114,000	28,200	r114,000
Dimension	metric tons	122,000	13,100	12,500	14,100	128,000	15,600
Combined value of copper, gold[5], silica stone (1993), silver, stone [crushed quartzite (1994-95], tripoli (1993), and values indicated by symbol W		XX	57,100	XX	126,000	XX	146,000
Total[4]		XX	313,000	XX	409,000	XX	441,000

e Estimated. p Preliminary. r Revised. NA Not available. W Withheld to avoid disclosing company proprietary data; value included with "Combined value" data. XX Not applicable.

[1] Production as measured by mine shipments, sales, or marketable production (including consumption by producers).

[2] Data are rounded to three significant digits; may not add to totals shown.

[3] Formerly identified as "Abrasives." Grindstones, pulpstones, and sharpening stones; excludes mill liners and grinding pebbles.

[4] Excludes certain stones; value included with "Combined value" data.

[5] Placer canvassing discontinued beginning 1994.

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fifth in industrial sand and gravel, and ninth in construction sand and gravel. Wisconsin climbed from 16th to 11th in the production of peat, and remained 11th in silver, and 12th of 14 States that produce gold. While being lower in the rankings than the previously mentioned commodities, significant quantities of crushed stone and lime were produced in Wisconsin mines and manufacturing plants.

The remainder of this narrative was derived from information provided by the Wisconsin Geological and Natural History Survey (WGNHS). Both the metallic and industrial mineral industries experienced significant activity during 1995. For the metal-mining industry, the successful operation of the Flambeau Mine and the continuing evaluation of Crandon Mining Co.'s (CMC) zinc-copper project in Forest County highlighted the year. For the industrial mineral industry, the ongoing review of proposed administrative rules to regulate mine reclamation was the principal issue of concern.

Flambeau Mining Co.'s open pit copper-gold-silver operation near Ladysmith, Rusk County, continued to be Wisconsin's major producer of metallic mineral ore. Mining of the massive sulfide ore, containing enriched levels of copper metal and smaller quantities of gold and silver, remained at near-peak levels. According to the Wisconsin Department of Natural Resources (DNR), no environmental compliance problems were encountered during 1995. Flambeau paid in excess of $6.1 million in 1995 for the occupational tax levied on the net proceeds of the mine—a requirement for metalliferous mining operations in the State.

CMC completed an environmental impact report (EIR) and most of the necessary permit applications for its proposed zinc-copper underground mine in Forest County. At yearend, the Wisconsin DNR was reviewing CMC's EIR and permit applications. WGNHS reported that this large, massive sulfide deposit comprises about 50 million metric tons of ore, with reported grades of zinc and copper that average 5% and 1%, respectively, over the entire ore body. Minor quantities of lead, gold, and silver are also present and potentially recoverable.

The Mining Investment and Local Impact Fund Board (MILIFB) is responsible for the distribution of certain net-proceed tax revenues from Wisconsin mining operations. The MILIFB's fund increased by $4.2 million, primarily from payments made by Flambeau Mining Co. (a Kennecott Corp. subsidiary). The MILIFB reported a final net balance of about $2.3 million after honoring all encumbrances and making disbursements to local communities. Expenditures were for mining-related impacts, notice-of-intent payments, as well as first-dollar payments in the Ladysmith area (about $2 million).

Metallic mineral leasing was at a much-reduced level in 1995; however, a proposal to lease several thousand acres of county forest land in west-central Wisconsin by Flambeau Mining Co. was under active negotiation at yearend.

Metallic mineral exploration proceeded at a moderate rate during the year. By early November, a total of 46 drill holes had been drilled and abandoned by three companies: BHP Minerals Inc., Sharpe Energy and Resources, Ltd., and Flambeau.

Statewide nonmetallic mining reclamation rules were the subject of several hearings. Chapter NR 135, which established minimum standards for the reclamation of nonmetallic mining operations, was mandated by the passage of the 1993 Wisconsin Act 464. But, the Department continued a postponement of the promulgation of NR 135 pending revisions to the proposed rule and potential statutory language modifications.

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[1]The terminologies "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data published in this chapter are estimated as of Dec. 1995. Estimates for some commodities, e.g., construction sand and gravel, crushed stone, and portland cement, are periodically updated. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

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TABLE 2

WISCONSIN: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE [2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit Value
Coarse aggregate (+1 1/2 inch):			
Macadam	W	W	$4.22
Riprap and jetty stone	172	$1,110	6.45
Filter stone	182	751	4.13
Other coarse aggregate	94	370	3.94
Coarse aggregate, graded:			
Concrete aggregate, coarse	1,410	6,240	4.42
Bituminous aggregate, coarse	696	3,180	4.57
Bituminous surface-treatment aggregate	173	830	4.80
Railroad ballast	71	318	4.48
Other graded coarse aggregate	419	1,820	4.35
Fine aggregate (-3/8 inch):			
Stone sand, concrete	W	W	8.52
Stone sand, bituminous mix or seal	21	85	4.05
Screening, undesignated	516	2,860	5.55
Coarse and fine aggregates:			
Graded road base or subbase	6,790	24,800	3.65
Unpaved road surfacing	948	1,830	1.93
Crusher run or fill or waste	555	1,680	3.03
Other coarse and fine aggregates	73	302	4.14
Other construction materials[3]	1,110	4,810	4.32
Agricultural:			
Agricultural limestone	405	3,150	7.78
Other agricultural uses	282	371	1.32
Chemical and metallurgical: Flux stone	69	267	3.87
Other specified uses not listed[4]	181	691	3.82
Unspecified:[5]			
Actual	7,130	31,400	4.41
Estimated	7,210	27,400	3.81
Total	28,500	114,000	4.01

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes dolomite, granite, limestone, limestone-dolomite, miscellaneous stone, sandstone and quartzite, and traprock; excludes quartzite value from State total to avoid disclosing company proprietary data.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes drain fields, roofing granules, and terrazzo and exposed aggregate.
[4]Includes disinfectant and animal sanitation, and lime manufacture.
[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

TABLE 3

WISCONSIN: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	r19	r22,000	r$82,600	r$3.75	202	21,900	$89,200	$4.07
Dolomite	r4	r1,080	r4,460	r4.13	7	1,800	7,200	3.99
Granite	10	1,350	2,530	1.88	9	1,200	2,340	1.96
Traprock	r1	W	W	r3.98	4	1,850	7,870	4.27
Sandstone and quartzite	3	1,130	4,750	4.22	4	1,770	[3]7,660	[3]4.33
Miscellaneous stone	1	W	W	7.13	—	—	—	—
Total	XX	26,200	98,000	3.74	XX	28,500	114,000	4.01

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "limestone-dolomite," reported with no distinction between the two.
[3]Excludes quartzite value.

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TABLE 4

WISCONSIN: CRUSHED STONE[1] [2] SOLD OR USED BY PRODUCERS IN 1994, BY USE AND DISTRICT[3]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[4]	129	484	W	W	151	724
Coarse aggregate, graded[5]	W	W	W	W	469	1,95 0
Fine aggregate (-3/8 inch)[6]	W	W	W	W	219	585
Coarse and fine aggregate[7]	2,630	10,200	W	W	2,550	8,360
Other construction materials[8]	1,240	5,350	4,140	18,100	—	—
Agricultural[9]	69	405	([10])	([10])	([10])	([10])
Chemical and metallurgical[11]	—	—	([10])	([10])	([10])	([10])
Other miscellaneous uses[12]	—	—	—	—	([10])	([10])
Unspecified:[13]						
Actual	941	4,280	1,140	5,150	—	—
Estimated	1,480	6,320	1,500	4,650	2,150	7,680
Total	6,490	27,100	7,080	30,200	5,740	20,100

	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Construction aggregates:						
Coarse aggregate (+1 1/2 inch)[4]	17	51	W	W	W	W
Coarse aggregate, graded[5]	—	—	—	—	—	—
Fine aggregate (-3/8 inch)[6]	10	33	9	17	—	—
Coarse and fine aggregate[7]	1,020	2,230	W	W	W	W
Other construction materials[8]	—	—	569	2,390	89	441
Agricultural[9]	282	([10])	32	([10])	49	376
Chemical and metallurgical[11]	—	—	—	—	—	—
Other miscellaneous uses[12]	—	—	—	—	—	—
Unspecified:[13]						
Actual	4,950	([10])	105	([10])	—	—
Estimated	59	536	458	1,820	1,560	6,420
Total	6,330	24,700	1,170	4,930	1,690	7,240

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."

[1]Production reported in District 8 was included with "District 6" to avoid disclosing company proprietary data; no crushed stone was produced in District 7.

[2]Excludes quartzite value from State total to avoid disclosing company proprietary data.

[3]Data are rounded to three significant digits; may not add to totals shown.

[4]Includes filter stone, macadam, riprap and jetty stone, and other coarse aggregate.

[5]Includes concrete aggregate (coarse), bituminous aggregate (coarse), bituminous surface-treatment aggregate, railroad ballast, and other graded coarse aggregate.

[6]Includes stone sand (concrete), stone sand (bituminous mix or seal), and screening (undesignated).

[7]Includes graded road base or subbase, terrazzo and exposed aggregate, unpaved road surfacing, crusher run (select material or fill), other coarse and fine aggregates, and roofing granules.

[8]Includes drain fields.

[9]Includes agricultural limestone and other agricultural uses.

[10]Withheld to avoid disclosing company proprietary data; included in "Total."

[11]Includes flux stone and lime manufacture.

[12]Includes disinfectant and animal sanitation and other specified uses not listed.

[13]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	7,150	$26,900	$3.75
Plaster and gunite sands	31	186	6.00
Concrete products (blocks, brick, pipe, decorative, etc.)	288	1,330	4.61
Asphaltic concrete aggregates and other bituminous mixtures	1,610	4,980	3.08
Road base and coverings[2]	4,520	11,200	2.49
Fill	1,300	2,280	1.76
Snow and ice control	135	471	3.49
Railroad ballast	5	21	4.20
Roofing granules	16	97	6.06
Filtration	47	129	2.74
Other	34	159	4.68
Unspecified:[3]			
Actual	7,740	23,000	2.97
Estimated	6,350	20,800	3.28
Total or average	29,200	91,500	3.13

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes road and other stabilization (cement and lime).
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 6

WISCONSIN: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2		District 3	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	649	3,010	3,410	13,200	1,660	5,260
Asphaltic concrete aggregates and road base materials[3]	1,280	3,610	1,970	4,910	1,430	3,020
Snow and ice control	13	52	59	253	5	11
Railroad ballast	—	—	—	—	—	—
Other miscellaneous uses[4]	15	89	32	100	14	89
Unspecified:[5]						
Actual	1,730	5,500	4,830	14,000	—	—
Estimated	228	680	2,590	9,400	1,080	2,470
Total	3,910	12,900	12,900	41,800	4,190	10,800

	District 4		District 5		District 6	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	158	691	W	W	1,020	3,540
Asphaltic concrete aggregates and road base materials[3]	218	481	17	45	1,200	2,750
Snow and ice control	—	—	W	W	16	31
Railroad ballast	—	—	—	—	—	—
Other miscellaneous uses[4]	18	40	—	—	—	—
Unspecified:[5]						
Actual	296	668	74	122	7	39
Estimated	287	859	25	57	1,030	3,950
Total	977	2,740	312	1,490	3,270	10,300

	District 7		District 8		Unspecified within all districts	
	Quantity	Value	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products[2]	W	W	286	1,090	—	—
Asphaltic concrete aggregates and road base materials[3]	428	929	791	2,500	W	W
Snow and ice control	W	W	W	W	—	—
Railroad ballast	—	—	5	21	—	—
Other miscellaneous uses[4]	W	W	W	W	—	—
Unspecified:[5]						
Actual	27	73	16	88	W	W
Estimated	591	1,500	518	1,910	—	—
Total	1,190	2,980	1,630	5,650	864	2,770

W Withheld to avoid disclosing company proprietary data; included in "Total."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Includes plaster and gunite sands.

[3]Includes fill, and road and other stabilization (cement and lime).

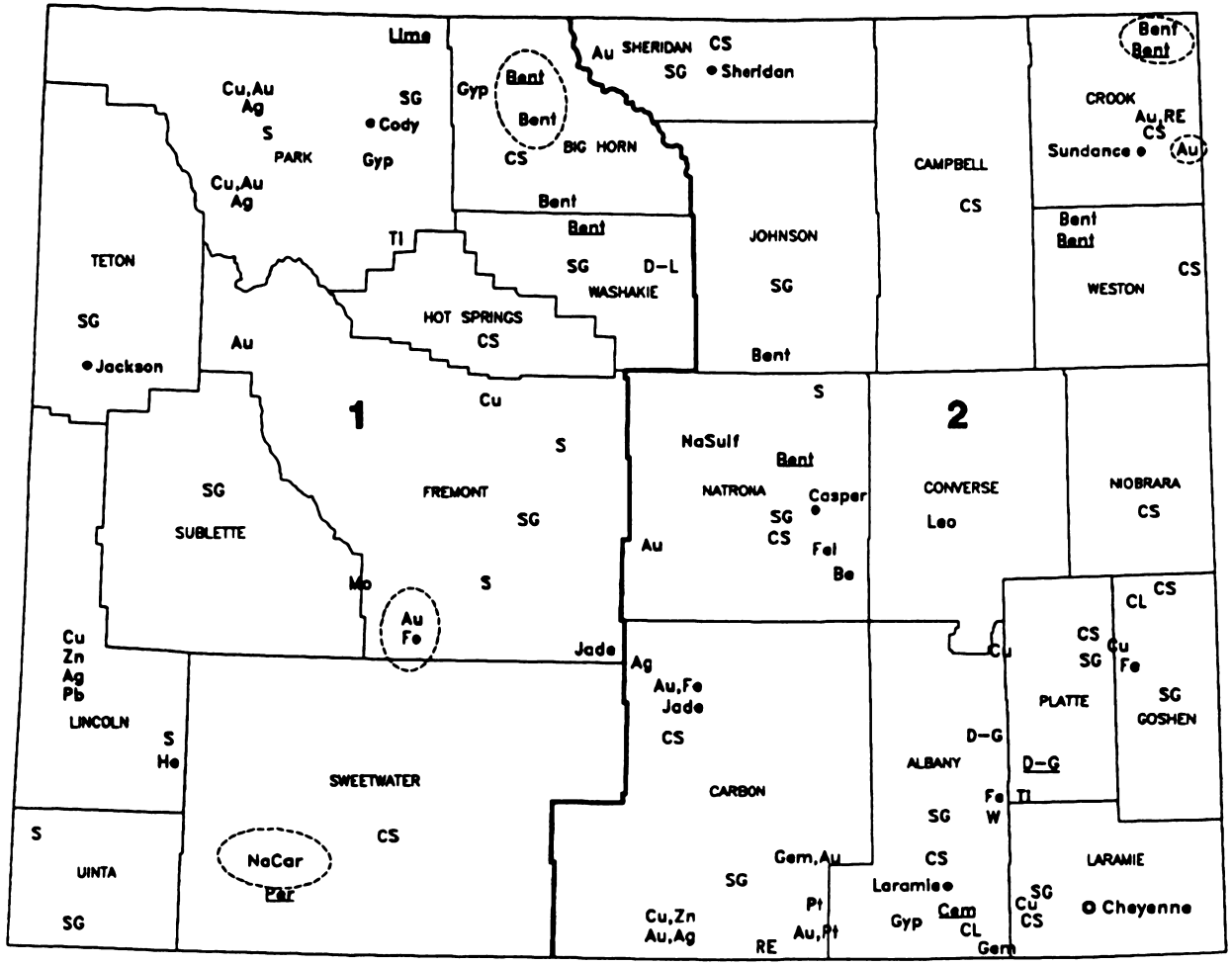
[4]Includes filtration and roofing granules.

[5]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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WYOMING



LEGEND

- State boundary
- County boundary
- Capital
- City
- 1 — Crushed stone/sand & gravel districts

Metals exploration activities are included on this map

MINERAL SYMBOLS

Ag	Silver
Au	Gold
Be	Beryllium
Bent	Bentonite
Bent	Bentonite mill
Cem	Cement plant
CL	Crushed Limestone
CS	Crushed stone
Cu	Copper
D-G	Dimension Granite
D-G	Dimension Granite plant
D-L	Dimension Limestone
Fe	Iron
Fel	Feldspar
Gem	Diamonds
Gyp	Gypsum
He	Helium
Jade	Jade
Leo	Leonardite
Lime	Lime plant
Mo	Molybdenum
NaCar	Sodium Carbonate
NaSulf	Sodium Sulfate
O	Olivine
Par	Perlite plant
Pt	Platinum group metals
Pb	Lead
RE	Rare Earths
S	Sulfur
SG	Sand and Gravel
Ti	Titanium
W	Tungsten
Zn	Zinc
	Concentration of mineral operations

0 100 Kilometers

Principal Mineral-Producing Localities

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THE MINERAL INDUSTRY OF WYOMING

This chapter has been prepared under a Memorandum of Understanding between the U.S. Bureau of Mines, U.S. Department of the Interior, and the Geological Survey of Wyoming for collecting information on all nonfuel minerals.

In 1995, Wyoming climbed in rank from 14th to 13th among the 50 States in total nonfuel mineral production value,[1] according to the U.S. Geological Survey (USGS). The estimated value for 1995 was $976 million, an 11% increase from that of 1994. This followed a 3.1% increase from 1993 to 1994 (based on final data). The State accounted for more than 2.5% of the U.S. total nonfuel mineral production value.

Wyoming's leading nonfuel minerals, by value, are soda ash and bentonite clays. In 1995, large increases in the values of both commodities accounted for the major portion of the State's increased nonfuel mineral production value. A smaller increase in construction and and gravel also contributed to the State's rise in value. In 1994, the State's increased value mostly resulted from increases in bentonite and crushed stone, accompanied by a relatively small drop in the value of soda ash. Compared with that of 1994, other nonfuel minerals that increased in value in 1995 were grade-A helium, crushed stone, lime, and crude gypsum. Decreases were reported for portland cement and gemstones.

Compared with USGS estimates of the quantities produced in the other 49 States during 1995, Wyoming remained first in the production of soda ash and bentonite and second in grade-A helium. Additionally, the State was a significant producer of crude gypsum. Soda ash (sodium carbonate) is an inorganic chemical extensively used in the manufacture of glass, soap and detergents, paper, and textiles; and it is used in foods as sodium bicarbonate. The United States is the world's largest soda ash-producing nation. Wyoming, one of only two producing States, is home to the world's largest known natural deposit of trona, the principal ore from which soda ash is refined. California produces a significantly smaller quantity of natural soda ash. Wyoming has not had any significant metal production since iron ore mining ceased in April 1984. A small tonnage of hand-cobbed beryllium concentrate was produced in Fremont County in 1986. In recent years, however, a modest amount of gold exploration has been taking place.

The Wyoming State Geological Survey[2] (WSGS) reported several of the State's soda ash manufacturers were expanding their operations in 1995. In January, FMC Wyoming Corp. announced plans to proceed with a $45 million expansion project designed to increase its soda ash production by 25%. FMC, which has been the only wholly U.S.-owned soda ash producer, announced the sale of one-fifth of its interest to two Japanese companies, Sumitomo Corp. and Nippon Sheet Glass Co. All of the domestic soda ash producers now are partly foreign-owned; of the total investment, just under one-half is U.S-owned. Wold Trona Co. continued with plans to construct a sixth

TABLE 1
NONFUEL RAW MINERAL PRODUCTION IN WYOMING[1 2]

Mineral		1993		1994		1995[p]	
		Quantity	Value (thousands)	Quantity	Value (thousands)	Quantity	Value (thousands)
Clays[3]	thousand metric tons	2,410	$73,400	2,530	$91,300	2,590	$152,000
Gemstones		NA	13	NA	13	NA	10
Sand and gravel (construction)	thousand metric tons	[e]3,400	[e]15,000	3,210	13,100	4,500	18,900
Stone (crushed)	do.	3,460	19,800	5,080	30,000	5,300	31,500
Combined value of cement [masonry (1993), portland (1994-95)], clays (common), gypsum [crude (1994-95)], helium (Grade-A), lime, and soda ash		XX	746,000	XX	746,000	XX	774,000
Total		XX	854,000	XX	880,000	XX	976,000

[e]Estimated. [p]Preliminary. NA Not available. XX Not applicable.
[1]Production as measured by mine shipments, sales, or marketable production (including consumption by producers).
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Excludes certain clays; kind and value included with "Combined value" data.

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trona mine and refining plant; construction of access roads began in 1995. Wold plans to produce a product called "Benetron" at its plant. Benetron is an acronym for "beneficiated trona" and can be used in applications not requiring as high a purity as that of regular soda ash. Benetron is about 96% to 97% pure soda ash, with regular soda ash being 99+% pure. Production of trona ceased for about 2 weeks after the collapse of a previously mined area at the Solvay Mineral Co.'s trona mine on February 3; mining resumed February 14, and full production was restored by the end of February.

In July 1995, the Wyoming Supreme Court ruled that counties can regulate construction aggregate by closing down producing companies in accordance with zoning and planning ordinances. Rissler & McMurry Co. opened a limestone aggregate quarry northwest of Alcova. The company had quarried limestone from a site on Bessemer Mountain west of Casper, but was prohibited from expanding that quarry due to opposition from individuals living near the site. Casper Construction Co. announced in November 1995 that it was abandoning efforts to continue production of river rock from a pit east of Casper due to objections from nearby residents. The company said it would move to a new source 20 miles east, near Glenrock, Converse County. Mountain Chemical Corp. announced plans to open another limestone quarry south of Laramie for chemical and cement manufacturing purposes. The company is adding a second kiln at its cement plant, nearly doubling capacity; the kiln is expected to be operational by early 1996.

Production of cut and polished decorative stone pieces of Wyoming Raven, a black granite, and Fantastico, a hard multicolored rock, continued at Sunrise Stone's quarry and fabricating plant in Platt County. In 1995, Sunrise acquired new polishing and engraving equipment and was producing finished monuments.

During 1995, Newmont Exploration Inc. dropped its option on the Rattlesnake Hills gold deposit in the Granite Mountains of central Wyoming. The property is currently held by Canyon Resources Corp., which is searching for a joint-venture partner. WSGS recently mapped the property and published the results in the Wyoming Geological Association's *1995 Guidebook to the Resources of Southwestern Wyoming*. WSGS investigations indicated gold occurred in Tertiary alkalic volcanics and in Archean exhalites. WSGS reported, based on unconfirmed reports, that more than a 9,000-kilogram (300,000-troy-ounce) resource has been identified with potential for expansion. Compass Minerals Co. of Reno, NV, continued to seek a joint-venture partner for its Copper King gold-copper property in the Laramie Range of southeastern Wyoming. The property is reported to contain a gold resource of about 16,000 kilograms (500,000 troy ounces), with some copper.

The State continued to receive considerable interest in diamonds, primarily in the State Line District in southeastern Wyoming and northern Colorado. This area has produced more than 120,000 diamonds to date. Radaurem Ltd. announced that its 140-metric-ton-per-hour mill on the Kelsey Lake property in the District would be in operation by December 1995. The Kelsey Lake kimberlites lie immediately south of the Colorado-Wyoming border and have yielded several gemstones, including a 14.2-carat diamond. Also, 10 "kimberlitic" diatremes and a 5-mile-long dike complex were recently discovered by Guardian Resources Ltd. in southwestern Wyoming. The company is drilling the property and the WSGS is conducting petrologic and geochemical studies of the ultramafic breccia. In the same area, Royal Gold Inc. was reportedly testing several lamproites (potassium- and magnesium-rich rocks) for diamonds.

SF Phosphates Ltd. Co., which operates a soil conditioner manufacturing plant southeast of Rock Springs, began a $30 million expansion project, doubling its sulfuric acid production capacity, in July. At this operation SF uses sulfur from the Carter Creek sulfur recovery plant north of Evanston, and phosphate mined north of Vernal, UT, the latter of which is shipped to the plant by slurry pipeline.

M-I Drilling Fluids Co., a subsidiary of Dresser Industries, purchased Fremont Chemical Co. of Riverton, a bentonite producer, during the third quarter of 1995.

Uranium continued to be mined in the State by in situ methods at Cogema Inc.'s operations at the Irigaray and Christensen Ranch properties in Johnson County and Power Resources, Inc.'s operations at the Highland and Morton Ranch properties in Converse County. Other companies with uranium development operations included Kennecott Uranium, Co., which continued to develop plans for an underground mine on Green Mountain, south of Jeffrey City in Fremont County, and Cameco U.S. Inc., which is investigating properties in the Red Desert area of Sweetwater County and the Boot Heel area of Albany County. Energy Fuels Nuclear Inc., a subsidiary of NUEXCO Inc., which announced plans in 1994 to begin uranium production from the Reno Ranch Deposit in Campbell County, idled all its milling operations.

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WSGS discovered a nickel deposit during a 1995 reconnaissance in southeastern Wyoming. Anomalous mineralization was identified in a layered mafic-ultramafic complex. Samples contained maximum values of about 3.7% nickel, 4.4% copper, 0.29-troy-ounce-per-ton-gold, 0.024-ounce-per-ton platinum, 0.12-ounce-per-ton palladium, 0.19-ounce-per-ton silver, and 0.08% cobalt. Other WSGS work in the Granite Mountains resulted in the discovery of a 1,200-meter-long (4,000-foot-long) ruby schist. Rubies in the schist were mostly poor quality industrial grade, although several stones appeared to be gem to near-gem in quality. The largest stone discovered by WSGS measured 5 centimeters (2 inches) across. In the same area, WSGS is conducting resource studies on several jade deposits.

[1]The terms "nonfuel mineral production" and related "values" encompass variations in meaning, depending on the minerals or mineral products. Production may be measured by mine shipments, mineral commodity sales, or marketable production (including consumption by producers) as is applicable to the individual mineral commodity.

All 1995 USGS mineral production data are estimates as of Dec. 1995. For some commodities, especially construction sand and gravel, crushed stone, and portland cement, estimates are updated periodically. To obtain the most current information, please contact the appropriate USGS mineral commodity specialist. Call MINES FaxBack at (703) 648-4999 from a fax machine with a touch-tone handset and request Document No. 1000 for a telephone listing of all mineral commodity specialists or call USGS information at (703) 648-4000 for the specialist's name and number.

[2]This report includes information provided by the Wyoming State Geological Survey.

TABLE 2
WYOMING: CRUSHED STONE[1] SOLD OR USED BY PRODUCERS IN 1994, BY USE[2]

Use	Quantity (thousand metric tons)	Value (thousands)	Unit value
Coarse aggregate (+1 1/2 inch):			
Riprap and jetty stone	55	$556	$10.10
Coarse aggregate, graded:			
Concrete aggregate, coarse	105	700	6.67
Bituminous aggregate, coarse	312	1,710	5.48
Bituminous surface-treatment aggregate	W	W	2.75
Railroad ballast	W	W	6.59
Other graded coarse aggregate	9	155	17.20
Fine aggregate (-3/8 inch):			
Stone sand, concrete	14	115	8.21
Stone sand, bituminous mix or seal	W	W	8.50
Screening, undesignated	6	9	1.50
Coarse and fine aggregates:			
Graded road base or subbase	867	2,090	2.41
Terrazzo and exposed aggregates	W	W	33.40
Crusher run or fill or waste	75	88	1.17
Roofing granules	1	25	25.00
Other construction materials	2,090	14,400	6.89
Agricultural: Agricultural limestone	39	275	7.05
Chemical and metallurgical: Lime manufacture	1	19	19.00
Special:			
Mine dusting or acid water treatment	9	250	27.80
Whiting or whiting substitute	2	88	44.00
Other fillers or extenders	42	1,560	37.10
Other specified uses not listed	45	200	4.44
Unspecified:[3]			
Actual	1,190	6,100	5.13
Estimated	221	1,640	7.42
Total	5,080	30,000	5.91

W Withheld to avoid disclosing company proprietary data; included with "Other construction materials."
[1]Includes granite, limestone, limestone-dolomite, marble, miscellaneous stone, quartzite, and volcanic cinder and scoria.
[2]Data are rounded to three significant digits; may not add to totals shown.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 3
WYOMING: CRUSHED STONE SOLD OR USED, BY KIND[1]

Kind	1993				1994			
	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value	Number of quarries	Quantity (thousand metric tons)	Value (thousands)	Unit value
Limestone[2]	7	925	$3,990	$4.31	10	1,520	$6,120	$4.04
Marble	1	74	2,450	33.10	1	93	3,250	31.60
Granite	2	2,380	W	W	3	3,410	19,900	5.30
Quartzite	1	W	W	6.28	1	W	W	10.00
Volcanic cinder and scoria	1	W	W	11.10	1	W	W	10.00
Miscellaneous stone	1	W	W	15.10	1	W	W	13.20
Total	XX	3,460	19,800	r5.72	XX	5,080	30,000	5.91

rRevised. W Withheld to avoid disclosing company proprietary data; included with "Total." XX Not applicable.
[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes "limestone-dolomite," reported with no distinction between the two.

TABLE 4
WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY MAJOR USE CATEGORY[1]

Use	Quantity (thousand metric tons)	Value (thousands)	Value per ton
Concrete aggregate (including concrete sand)	524	$2,640	$5.04
Plaster and gunite sands	2	18	9.00
Concrete products (blocks, brick, pipe, decorative, etc.)	18	43	2.39
Asphaltic concrete aggregates and other bituminous mixtures	484	2,500	5.17
Road base and coverings	1,310	4,850	3.69
Fill	147	434	2.95
Snow and ice control	31	167	5.39
Other[2]	35	188	5.37
Unspecified:[3]			
Actual	354	1,530	4.32
Estimated	298	751	2.52
Total or average	3,210	13,100	4.09

[1]Data are rounded to three significant digits; may not add to totals shown.
[2]Includes filtration and roofing granules.
[3]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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TABLE 5

WYOMING: CONSTRUCTION SAND AND GRAVEL SOLD OR USED IN 1994, BY USE AND DISTRICT[1]

(Thousand metric tons and thousand dollars)

Use	District 1		District 2	
	Quantity	Value	Quantity	Value
Concrete aggregate and concrete products	260	1,250	264	1,390
Plaster and qunite sands	2	18	—	—
Concrete (blocks, brick, etc.)	(2)	W	18	W
Asphaltic concrete aggregates and road base materials	324	1,100	160	1,400
Road base and coverings	684	2,860	628	1,990
Fill	63	224	84	210
Snow and ice control	3	W	28	W
Other miscellaneous uses[3]	23	148	12	250
Unspecified:[4]				
Actual	354	1,530	—	—
Estimated	229	527	70	224
Total	1,940	7,660	1,270	5,460

W Withheld to avoid disclosing company proprietary data; included with "Other miscellaneous uses."

[1]Data are rounded to three significant digits; may not add to totals shown.

[2]Less than 1/2 unit.

[3]Includes filtration and roofing granules.

[4]Includes production reported without a breakdown by end use and estimates for nonrespondents.

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